



## **Dento Alveolar Abscess.**

By A. BERGER, D.D.S.

*Chief of the Oral Surgery Clinic, N. Y. C. D.*

Looking over the current literature of some of our leading dental journals four or five years back, I find that the subject of dento alveolar abscess is treated very much as a negligible quantity, or at least it does not engage the attention which it deserves; and yet alveolar abscess is a dental lesion, which, in its frequency of occurrence, is second only to dental caries. In fact, from the number of abscesses that have come under my observation, I am tempted to say that there are, comparatively speaking, but few mouths in which an alveolar abscess could not be traced at one time or another, caused by either a deciduous or a permanent tooth.

I believe that all the radiograph specialists who are engaged in oral radiography will corroborate me in my statement, that their work in connection with dental radiography consists chiefly in determining the presence, the cause and the extent of an abscess, or the positions of roots and their canals to prevent conditions conducive to the formation of an alveolar abscess.

To further illustrate the preponderant ratio which alveolar abscess bears to other buccal lesions, I will quote the statistics of the various cases that applied for and received treatment at the Oral Surgery Clinic of the New York College of Dentistry, in the years indicated. These

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cases comprise various forms of stomatitis; cysts; tumors malignant, and non-malignant; fractures of the maxillæ; necrosis; maxillary sinusitis; some pyorrhea cases, and buccal manifestations of systemic diseases.

	ABSCESS	FRACTURES	OTHERS
1910—1911 .....	300	212	164
1911—1912 .....	260	135	190
1912—1913 .....	280	121	281

### Definition of Dento Alveolar Abscess.

An abscess, which is primarily located in the alveolus of a tooth and is caused by a dental lesion, may be designated as a "dento alveolar abscess."

The cause of a dento alveolar abscess can be traced in the majority of instances, with but few exceptions, to a devitalized tooth containing a decomposing pulp or remnant of a pulp, undergoing a suppurative inflammation. The bacteria active in the process of decomposition and suppuration are infesting the buccal cavity, whence they rapidly find their entrance to an exposed or nearly exposed pulp in a carious tooth; or they may have been sealed into a filled tooth at the time of operation. The activity of these bacteria is often inhibited under these conditions by the antiseptic measures taken, but they will become active again upon the evanescing of the drugs applied.

Another channel through which they may have found their entrance is the apical foramen of a tooth devitalized by traumatism or by some pathologic condition, or into an imperfectly cleansed and filled root canal. From there the bacteria, or their poisonous products, are carried beyond the apical foramen. Here they cause irritation and inflammation of the surrounding tissues, which is followed by the exudation and coagulation of the serum of the blood, forming a nidus of infection. This nidus of infection is combated by the proliferated leucocytes which results in the breaking down and peptonization of these cells and the surrounding tissues, and by means of the pyogenic bacteria are transformed into pus. This is in a confined area and by the physiologic process of repair tissue formation, the pus is pressed upon and forced in the direction of least resistance. This process is called, "Pointing of the abscess."

### Causes of Alveolar Abscess.

For the sake of clearness, I will classify dento alveolar abscess under the fewest possible headings.

Dento alveolar abscess.....	{ Acute Chronic
Chronic alveolar abscess.....	{ Fistulous Non-Fistulous



## Exclusive Contributions

The conditions causative in the formation of alveolar abscesses are the following:

1. A devitalized pulp exposed or nearly exposed in a carious tooth.
2. A pulp devitalized from the irritation of a filling inserted over this organ, exposed either by instrumentation or by caries.
3. A pulp devitalized by some constituent or impurity of a plastic filling.
4. Where the pulp is devitalized by the shocks caused by thermal conductivity of large metallic filling.
5. A filling inserted over an infected and unattended pulp.
6. A filling inserted over a devitalized but unextirpated pulp.
7. Where the pulp has been partly removed and the pulp canal but partly filled.
8. Where all of the pulp has been removed and the root canal partly filled.
9. Where an evanescent drug is depended upon as a permanent sterilizer, and applied in a root canal to substitute a filling.
10. Where the root canal filling used is of an absorbing or disintegrating nature, and does not fill the root canal hermetically.
11. A multirrooted tooth with one or more of the root canals left unfilled.
12. A broach broken in a root canal, preventing its proper cleansing and filling.
13. Perforation through the side of a root, or through the floor of the pulp chamber of a bicuspid or molar.
14. Broken down roots left in the alveolus.
15. Unerupted teeth.
16. Impacted teeth.
17. Unerupted supernumerary teeth.
18. Erupting third molars.
19. Teeth devitalized by the action of orthodontic appliances.
20. Teeth devitalized by a traumatic injury.
21. Teeth devitalized by advanced pyorrhea.
22. Teeth devitalized through the exposure of the apex of its root or roots by atrophy of the gums and the alveolar process.
23. Teeth devitalized through a pathologic process of the adjacent tissue.
24. Teeth devitalized by some obscure causes.
25. Where some septic substance is forced through the apex.
26. Where a tooth dies under a shell crown.

From the above enumerated etiologic factors we may readily postu-

## Items of Interest

late that a normal tooth, normally placed in the alveolus and in the arch, is never productive of an alveolar abscess.

### **Acute Alveolar Abscess.**

An acute alveolar abscess caused by a devitalized tooth in its incipient stages presents symptoms similar to those characteristic of a septic apical periodontitis: a constant, gnawing, throbbing pain in the area, elongation, of the tooth and tenderness upon percussion. In



Fig. 1. Abscess of unerupted and partly formed second lower bicuspid devitalised by trauma of orthodontic measures.

the advanced stages the symptoms are not unlike those caused by abscesses in other parts of the body. A constant deep, throbbing pain which is sometimes excruciating; a local and general rise of temperature, redness, swelling, pus and impaired function.

The severity of the symptoms is modified, or, more properly speaking, proportionate either to the extent of the infection, or more often to the amount of resistance offered by the tissues to the pus in its course of pointing. Hence, the symptoms of alveolar abscesses located in the mandible are, as a rule, more severe and of longer duration than those caused by abscesses of the superior maxilla. The reason of this clinical fact is obvious. While the superior maxilla is constituted mostly of cancellous bone within thin plates of compact bone, through which the pus finds a more ready egress into more yielding tissues, the mandible is formed of rather thick, compact bone, in which the roots of the teeth are lodged quite deeply. This condition is most pronounced in the lower third molars. These teeth are most frequently malposed, impacted, or so enclosed in the external and internal oblique ridges, or their roots may be so imbedded in the ascending ramus that the abscesses caused by them often present very alarming symptoms.

### **Treatment.**

The diagnosis having been made and the etiologic factor ascertained, our line of treatment will be materially modified by the consideration, whether the

## Exclusive Contributions

offending tooth or root is to be extracted or retained. At all events the evacuation of the pus is paramount. If extraction is determined upon extract at once. By extracting the guilty tooth two steps in our treatment are accomplished: (1) we remove the cause; (2) an outlet is afforded for the escape of pus. For abscesses located in the superior maxilla, where extraction is resorted to, in the majority of cases no other operative measures will be required. Owing to the anatomical relation



Fig. 2.



Fig. 3.

Fig. 2. Partly formed superior left incisor devitalised and abscessed through a traumatic injury with its incisal edge broken off.

Fig. 3. Superior left central incisor with a dowel penetrating through its side.

of the soft tissues connected with and attached to the superior maxilla these abscesses are, as a rule, circumscribed and their evacuation is greatly favored by gravitation. It occurs but rarely that an abscess in the superior maxilla will point so, that an external incision would be necessary, and such procedure is hardly ever, if ever, justifiable. As I have stated above, the extraction of the tooth will almost invariably secure sufficient drainage, and if the pus has penetrated through its bony walls, it is more readily reached by an internal than by an external incision.

Abscesses located in the mandible are, as a rule, more diffused, more complicated, and very often will not be controlled by the extraction of the offending tooth, unless it is taken at an early period. But if the pus once has reached subperiosteal areas, from there it will readily gain entrance into, and is, so to say, invitingly accommodated between the somewhat loose and elastic muscular and subcutaneous tissues and the facia, and will burrow down into the submaxillary triangles. These abscesses while still located between the periosteum and the bone, if incised over the point containing the pus, will respond to treatment very

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satisfactorily, but if the pus once burrows down into the submaxillary triangles, an external incision will be more expedient. Though the pus may be reached from the inside, but an imperfect drainage can be secured in that way.

### **Abscesses in Mouths of Children.**

Too much stress cannot be laid upon the importance and the very particular care to be exercised in abscessed cases of children during the period of the development and eruption of the permanent teeth. Owing to the bone absorption caused by this physio



Fig. 4.



Fig. 5.

Fig. 4. Abscessed inferior left first molar with its root canals unfilled and perforation of its distal root with wire passing through it. Also abscessed second bicuspid with unfilled root canal

Fig. 5. Inferior third molar with unfilled root canals causing an abscess. This is the kind of tooth which owing to its position and formation is best out.

logic process, the infection is very readily carried into the deeper areas, which may result in extensive necrosis and the loss of the permanent teeth. At least five cases have come under the writer's observation in which a great part of the body, the ramus, and the condyle of the mandible have been lost through necrosis which originated with a dento alveolar abscess.

### **Surgical Treatment of Abscesses.**

Alveolar abscesses, as a rule, point upon the buccal or labial side of the alveolus. In some instances, however, a lateral incisor, a central or cuspid at times, and very rarely abscesses forming upon the palatal root of a superior molar will point upon the palate. Abscesses of the mandible point upon the lingual aspect even more rarely.

The erroneous idea, that an abscessed tooth should not be extracted before the swelling subsides, is still maintained by some members of the profession. Their argument is that the infection may be carried into the deeper and surrounding tissues through the lacerations caused

by the extraction. They seem to overlook the fact that by extracting we eliminate the cause, and that we can more readily reach the focus of infection with antiseptic solutions. The clinical truth is, that the extraction of the tooth is almost invariably followed by a very gratifying relief to the patient and subsiding of the symptoms.

When to incise is also a step much discussed in the treatment of an abscess. In the writer's opinion, just as soon as the presence and the location of the pus is determined, an incision to reach the same is justifiable, provided we have decided upon such a course. If we stop to consider the process of pointing of an abscess we will find that the pus



Fig. 6.



Fig. 7.


Fig. 6. Abscess of an inferior temporary second molar with erupting permanent teeth. These cases are very prone to necrosis if not assiduously attended.

Fig. 7. Abscess of superior right central incisor which was extracted. Also shows a large area of necrosis containing the lateral and cuspid teeth removed later.

in its progress in the direction of least resistance destroys the tissues before it, and the more destruction of tissue we have the more the patient suffers, and the more marked or unsightly the resulting scar is.

#### **Aseptic Precautions.**

Surgical cleanliness should be observed very closely in incising an abscess. Wash the area first with ether or absolute alcohol, or bichloride of mercury solution 1:5000, and then paint it with tincture of iodine. Select the lowest point of fluctuation and make your incision, when opening externally, just large enough to secure thorough drainage. When the pus is reached with the lance and the opening enlarged to the desired size, through this aperture insert a pair of blunt shears and open up within the abscess cavity. By doing so we secure a convenient drainage with a comparatively small outer opening. This procedure is also a safe precaution against injuring some of the impor-



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tant structures when operating upon the neck. Next flush out the abscess cavity with an antiseptic solution, remove all of the infectious material possible and pack it with your favorite dressing. The dressing should be changed at least every twenty-four hours, until we have conditions quite under control. External incisions should always be made with the lines of the features.

### **Chronic Alveolar Abscess.**

Chronic alveolar abscesses may be classified as fistulous and non-fistulous.

The fistulous variety are alveolar abscesses which have passed through the acute stage, and in which the pus has established for itself a point of evacuation either within the buccal cavity, about the root area of the affected tooth or somewhat more remotely or around the gingival margin of the tooth, or externally. The disturbing symptoms are very slight, or none. They usually present a small opening from which the discharge is quite copious and constant in some cases; in others the orifice of the sinus will close up and is burst open by the accumulation of pus from time to time. This is designated by the laity as "gum boil." At the orifice of these chronic sinuses we may have quite an aggregation of hypertrophied tissues, which gives the appearance of a small epulis. but a slight pressure, as a rule, will cause the exudation of pus, at which point a probe can be inserted within the abscess cavity.

Chronic alveolar abscesses of the non-fistulous variety, may have presented more or less severe or no acute symptoms at the time of their formation or at any later period. They are more often detected by means of the radiograph while seeking information regarding some of the adjacent teeth or when trying to explain some remote or obscure condition. These insidious abscesses are carried about by the patient sometimes for any number of years without their being aware of their existence. Whether this quiescent state is due to an inhibited activity, or whether the pus and the infectious ptomaines formed are so absorbed or carried off by the lymphatic system, I am unable to say. Nor can I say with any sense of certainty what constitutional effect their constant absorption may have upon the patient; whether their effect is cumulative or whether they are eliminated by the proper channels from the system; but I do know that they are accompanied at times with an extensive destruction of the surrounding tissues, involving not infrequently some of the adjacent teeth and rendering them devitalized. When located in the molar area they may find a point of evacuation into the maxillary sinus. I have seen some cases where this condition would hollow out almost the entire superior maxilla, though the offending tooth was a bicuspid or cuspid. At times these dormant abscesses do become active and present all the symptoms of an acute alveolar abscess.



It is advanced and maintained by some that chronic abscesses or other lesions which are accompanied with a suppurating process such as pyorrhea alveolaris and causative factors in endocarditis or arthritis.

They base their claim upon the clinical experience that patients suffering from the above-mentioned diseases upon the elimination of such septic conditions as abscesses or pyorrhea alveolaris, improve very markedly and the symptoms partly or entirely disappear.

Our treatment of these abscesses will be greatly modified by the consideration whether we will extract the offending tooth or desire to retain it. If extraction is decided upon, the removal of the tooth, and subsequent



Fig. 8.



Fig. 9.

Fig. 8. Chronic abscess caused by a portion of the superior right first molar root with an extensive necrosis resulting in the devitalisation of the two bicuspid teeth and infection of the maxillary sinus.

Fig. 9. A very small portion of a bicuspid root broken in the extraction, causing extensive necrosis and involvement of the maxillary sinus.

antiseptic measures will give good results. In those cases where the necrosed and infiltrated area is considerable, curetting and packing of the cavity is advisable. This also applies to the abscessed teeth of the fistulous variety.

When we desire to retain the tooth, the following treatment in the writer's hands has given very satisfactory results.

Open up into the tooth so as to gain direct access into the root canal or canals, and clean out the same at the first sitting the best you can, and seal into them Buckley's tricresol and formalin. If pus is draining through the root canal, let it remain open for at least the first twenty-four hours. In those cases where the discharge of pus is quite copious, and can hardly be expected to drain through the root canal, another point of evacuation may be secured by drilling through the outer alveolar plate, with a large round burr or with a trephine. At

the next sitting the root canal should be opened and cleaned out to the apex, and the tricresol formalin sealed in hermetically. Continue this until the root canal is cleaned and reamed out to the apex, and rendered aseptic. Fill the root canal with a permanent filling material, which will seal the apical foramen hermetically, and which is not prone to disintegration, nor to infection by absorption. Should the discharge still continue through the pathologically or surgically formed sinus, root amputation, and curetting will be the resort.

**Prognosis.**

The prognosis in those cases where extraction is the treatment and the necessary antiseptic measures are properly carried out, is very favorable. It



Fig. 10. Small portion of lateral incisor causing an abscess, with extensive necrosis which penetrated to the nasal cavity.

is really surprising how some of these very filthy cases will clear up much more readily than a lesser infection would in any other part of the body. Where we desire to retain the tooth, the prognosis is in direct ratio with its antero-posterior location in the arch, with the exception of the bicusps: the anterior single-rooted teeth, having more accessible root canals, are more readily and thoroughly cleansed and sterilized, and respond kindly to treatment; but the posterior multi-rooted teeth will offer much more difficulties. Some of the roots are so inaccessible or tortuous that it is almost impossible even for the most dexterous operator to cleanse and fill them to the apex. For this reason, in my estimation, the saving of abscessed teeth posterior of the first molars is contra-indicated. I advocate extraction, particularly of the upper second molars on account of the proximity of the roots of these teeth to the maxillary sinus. And since an abscess formation is always accompanied with more or less bone destruction, I prefer the loss of a tooth, to the exposure and infection of this cavity. The statement that all those

abscessed teeth, the root canal or canals of which can be rendered thoroughly aseptic and filled to the apex, and about the apex or apices of which all infection can be eliminated, will respond favorably to treatment, is not always true.

In this connection I will describe two operations which ought to be resorted to more often by the dental surgeon in the conservative treatment of abscessed teeth, namely, alveolotomy and root amputation.



Fig. 11. Chronic alveolar abscess of a superior right first molar which evacuated within the maxillary sinus.

**Alveolotomy.** Alveolotomy is a much less formidable operation than its name implies: Select a large, round burr and drill through the gums and alveolar process to the apex of the tooth in question. The conditions where this treatment is indicated are as follows: In the incipient stages of abscess formation with symptoms of pericementitis, when the tooth is so tender to touch that we are unable to operate on it; or where we are unable for some other reason such as an obstruction in the root canal to reach the apex and permit the escape of the mephitic gases there confined. Where pus has already formed, but as yet has not penetrated through the alveolar process, we secure a chance for its escape in this way and afford a great deal of relief. Before drilling through the alveolus we may anesthetize the area with a local anesthetic or we may dip the burr into phenol and depend upon the escharotic action of this drug to desensitize the tissues before it.

**Apicoectomy.** Root amputation, in the treatment of dento-alveolar abscesses, is an operation of necessity and not that of choice. Although when properly carried out it almost invariably gives good results, it should be resorted to only when other less radical methods have failed.



Fig. 12.



Fig. 13.

Fig. 12. Shows partly filled root canals of the lateral and cuspid teeth with extensive necrosis about them.

Fig. 13. Shows the root properly filled, the roots amputated and the area of necrosis curetted.



Fig. 14.

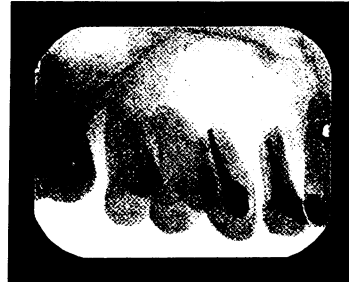


Fig. 15.

Fig. 14. Abscess of a superior left lateral incisor in which some drug upon cotton was used for a root canal filling. The extensive necrosis caused devitalisation of the cuspid tooth. This type of cases call for root amputation.

Fig. 15. The same case with the roots amputated and the area curetted.

The conditions where this operation is indicated are the following: Where the area of necrosis is so large, and the infiltration of pus into the surrounding tissues is so extensive, that thorough asepsis cannot be established, and all of the infected and broken down tissues cannot be eliminated by the medicaments conveyed through the root canal or canals

of the offending tooth. Where a broach is broken in, let us say, the apical third of the root which precludes the possibility of properly cleansing and filling the root, it is good practice to fill the root to the broach and amputate the part containing the foreign body. Multirooted teeth, one root of which has been devitalized by extensive pyorrhea or atrophy of the gums and the alveolus are also good subjects for this procedure. The pulp chamber and the canals of the retained roots should be filled, and the one bereft of its bony support should be amputated.

Before undertaking this operation, it is advisable to have the root canal rendered aseptic and filled, and to secure a good radiograph to show the condition of the root and its surrounding tissues and its position.

Produce a semilunar incision with a sharp lance, cutting through the tissues to the bone, about one-half of an inch from the gingival margin, with its crescent toward the crowns of the teeth. With a periosteum elevator raise this flap of tissue and expose the bone. A small ridge produced by the root of the tooth will usually indicate about the position of the apex. With a surgical burr, a trephine or else with a chisel, remove the bone overlying the apex and expose the same. By doing this we have a clear field of operation, and will avoid such undesirable mistakes as injuring or amputating the adjacent teeth. We can now with a fissure or round burr cut away the portion of the root penetrating the abscess cavity and devoid of its bony support. The stump end should be rounded off and smoothed next with curette or finishing burr and the entire abscess tract curetted out, removing all the débris and infected tissues. Flush out the cavity next, with an antiseptic solution, and dress it so that the edges of the wound can be approximated.

Where the area of infection is not very extensive after a few dressings the wound can be left unpacked, instructing the patient to use an antiseptic mouthwash.





## Dental Restorations for the Best Interests of the Patient.

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By FORRY ROHRER GETZ, D.D.S., New York City.

*Read before the Second District Dental Society of the State of New York,  
January, 1914.*

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Mr. President, Members and Friends of the Second District Dental Society of Brooklyn: It has always been a pleasure for me to be present at any of your meetings, and to-night I feel honored in appearing before you as your essayist.

A number of months ago I was engaged upon the most difficult part of one of the most discouraging problems in operative and prosthetic dentistry that it has ever been my fortune to meet with in the course of practice. The conditions that I found to exist and the experiences met with in that particular case aroused such an unusual degree of sympathy for the patient and such a feeling of resentment toward the man or men whose lax methods and patently bad practice had produced such an accumulation of evils and distressing conditions for the patient that frequently while working for the patient I came near to saying audibly some things that were more forceful than elegant.

I do not know, and would rather not know, who was responsible for the state of that patient's mouth, and what I have to say is purely impersonal, though inspired by and based upon the actual conditions found in that and other cases, from a number of which I have had slides made that I will show to you later.

I wish to bring out what seems to be a fact, if one may take as



evidence the states in which many mouths are found, that there are a great many people paying for professional advice and services who reasonably could expect those services to be better; and in order to cover the ground that is in mind, it was necessary to take a subject which in its wording is rather broad, and in which no leads or bypaths will be followed, however tempting they may be for the study and presentation of the details of particular methods or the treatments of special cases. It will cover, therefore, in a general way such ground only as lies within the limits of every-day, general practice, going into the special branches of dentistry only as they enter into the correction of conditions and the treatment of a case as a whole with a view to possible future developments by unavoidable losses, and laying a little more emphasis perhaps upon the crown and bridge part of prosthetic dentistry.

Under such circumstances no sharp and distinct lines can be drawn between what constitutes the treatments and restorations of operative dentistry and what enters into prosthetic replacements, or the things that orthodontic considerations require from these two branches, because in the mouth all of these are correlated and intimately associated in a common service, where fillings, pulp work and root-canal treatment and filling become just as much a part of good prosthetic dentistry as they are of operative—indeed, more so, for I would rather have a dying or dead pulp to deal with under a filling than under a bridge abutment.

**Early and Prompt  
Dental Attention  
Recommended.**

As many of the conditions presenting at adult age and later life, and needing prosthetic restorations, originated in the neglect of the deciduous and first permanent teeth, a few trite statements are in place. The deciduous teeth should be cared for, properly filled and retained in the jaw until they are lost naturally, or until extraction becomes necessary to make room for the oncoming permanent teeth.

With the appearance of the permanent teeth, especially of the lower molars and bicuspid, the most painstaking vigilance should be exercised to find and stop the beginnings of caries, as one of the best means, not only of preserving the individual teeth, but of guarding against the necessity of future prosthetic restorations and the varied forms of malocclusion that always follow the early loss of these teeth. Therein it may be truly said that "An ounce of prevention is worth a pound of cure."

Occlusal fissures that are deep or open should be cut out and filled early, at such times and in such manner as is best suited for the child. This practice is infinitely better than to leave them until decalcification and discoloration appear, only to find when the tooth is cut into that the infection has followed the tubules, frequently down to the pulp, without



showing much exterior evidence. A fissure that will barely admit the point of the smallest explorer frequently proves to be the entrance to a veritable little cavern beneath.

The approximal points should be watched and the teeth separated where there is any doubt of the absence of the beginning of decalcification. Where approximal decalcification has begun, extensive cutting and extension for prevention methods in the teeth of children do not seem to be the most conservative. There is nobody who cuts tooth tissue with less compunction than I where radical measures are called for, but in children's teeth heroic measures are not justifiable. Extensive cutting, the presence of large masses of metal or other fillings, have a decided detrimental effect upon the pulp, and only hasten complications that are much too prone in connection with the first permanent molars and bicuspid. Better to keep the cavity preparation within reasonable limits, leave the remaining healthy dentine and enamel undisturbed as long as possible, and if decay does occur, more extensive cutting can be done later with less danger to the pulp and at a time when the patient views the operation more reasonably and is better able to sit through the lengthy operations from which even adults shrink. There is middle ground everywhere, and I do not want to be understood as saying that it is not desirable and wise to insert foil fillings in many cases in the mouths of children, but with the average child the infliction upon his powers of endurance amounts almost to brutality.

**Recurrence  
of Caries.**

In this connection I want to make mention of the recurrence of decay under fillings, particularly under occlusal fillings, and perhaps more so in the lower molars. This is frequently spoken of as originating from an area of infected dentine that had not been entirely removed down to healthy tissue. I am constrained to take a different view of this condition. By careful preliminary examination of the outlines of many occlusal fillings of cement, amalgams and gold, I am convinced that in more than half of such cases of recurrence it is traceable to insufficient cavity preparation in not cutting to the limits of the mesio-distal and linguo-buccal terminations of the fissures, where a new starting point is left for decay to work its way down by the side of and under the filling, and to do irreparable damage before it is detected.

**Pulp  
Removal.**

In many of these cases of extreme decay and infection, where large masses of filling materials would come very close to the pulp, the best practice is to remove that pulp at once, and follow that up



with the most careful root canal technique of enlarging, cleansing and filling. I should like to go into more detail if time permitted and show you several sets of burs that I have had made and find indispensable in this work. In many cases it is both desirable and advisable to protect the pulp. It is largely a matter of judgment, and the most important thing is to have the patient, parent or nurse understand that, at the first suggestion of trouble, he must report at once, or go to a dentist if away from home, to avoid much pain, an abscess and possible loss of the tooth.

I admit that there are cases in which pulps may be nursed along and give no trouble for years, but when the trouble does come, sooner or later, with any of the symptoms and states accompanying a dying or dead pulp, the conditions may have already progressed beyond all power of again establishing a clean and healthy state of the root canals and the surrounding tissues and the permanence of such a tooth, and of course of any work upon it in the way of fillings or crowns, is, in many cases, only a matter of the degree of tolerance of the tissues surrounding it. In the main, I am convinced that, in all doubtful cases, pulp removal and careful filling of the root canals is the most conservative practice and will keep such teeth longer and with better final results.

In pulp removal or cleansing of canals in which the pulp has died, the canals in the mesial root of the lower molars and the mesio-buccal root of the upper molars need particularly careful attention. I never refill such teeth or crown them without investigating these canals, which in scores of cases I have found apparently untouched, while the larger and more readily accessible were, in many instances, nicely filled; in others there was anything from gutta-percha, gold, cement, silk fibre, iodoform and cotton, and plain cotton, to wooden pegs and metal pins. History of abscess or chronic abscess existed in the majority of cases.

#### **Restoration of Lost Teeth by Prosthetic Methods.**

Progressively, if for any reason a tooth has been lost, and we may take the lower first molar for example, we at once look to the next adjoining tooth for some means of holding the replacement in position by some method which will give the highest degree of present service and comfort, and also ultimately prove to be the most conservative measure in the light of past experience with identical or similar conditions. Let us suppose that the second bicuspid and second molar are perfectly sound and in good condition and position; quite naturally we feel reluctant to do anything to them, but we find also that, by reason of their shape, there is considerable space between their occlusal surfaces and those of the opposing upper teeth. You will agree with me in saying

that, if we can replace the lost tooth without marring the surfaces of the bicuspid and second molar, it will be the most conservative treatment. This is possible with the clasp form of detachable bridge.

Fig. 1 and Fig. 2 are outside and inside views of such a bridge in



Fig. 1.



Fig. 2.

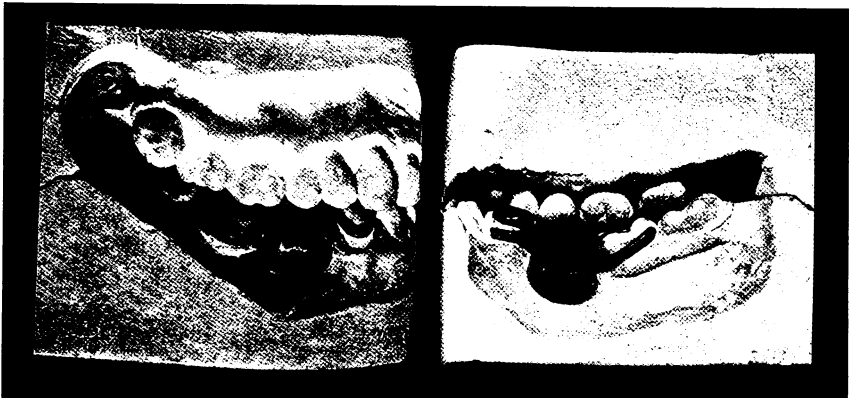


Fig. 3.

Fig. 4.

position. Before this bridge was made, the molar was tipping forward and had rotated about 45 degrees. Nothing was done to either molar or bicuspid except to make a neatly fitting appliance.

Fig. 3 and 4 are illustrations of another case with conditions somewhat different, but involving similar principles in its treatment. The bicuspid was solid, but in infra-occlusion and not favorably shaped for a clasp. The molar was tipped forward and had a large gold filling. Half-round clasp wire was bent to get uniform bearing on the bicuspid and the lug extension made to raise the occlusion. The same was done for the molar, except that in addition a tapered hole was cut into the

gold filling to receive a small downward extension of the lug to keep the molar in its present position. This appliance has been in most satisfactory service for ten years, with no effect upon the abutment teeth.

Let us suppose that there is a very close articulation between the two adjoining teeth and their opposites. As it happens, more often than otherwise, that these teeth have cavities or fillings already in them, it is



Fig. 5.



Fig. 6.

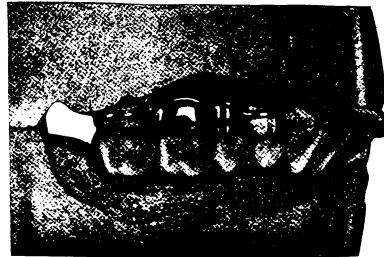


Fig. 7.

a simple matter to adapt the fillings already in place for the bearing points of the clasp bridge, or if they are not of the proper shape, size and material, it is even better to insert foil fillings or cast fillings and shape them in just the manner desired. If, however, as sometimes happens, these teeth have close articulation and are perfectly sound, we are justified in making fillings for the bearing points, because the arguments for a good and efficient masticating apparatus and for maintaining its efficiency, for that as well as for other reasons, by keeping the teeth in their proper normal positions, outweigh any objection to filling the teeth in such a circumstance.

Fig. 5 shows such a case before treatment. There was a gold filling that could be adapted for a bearing place in the molar, but it was necessary to insert a foil filling in the bicuspid.

Fig. 6 is an outside view and Fig. 7 an inside view with the bridge in place.

The point to be brought out is that any one of these three methods is more conservative than doing nothing, and also more efficient and more conservative than any other of a number of methods that are so



Fig. 8.



Fig. 9.



Fig. 10

often employed. The open-face crown still appears, but there is very little excuse for it, and still less for the use of a shell crown over a good tooth. The cast filling or inlay that would be permissible on a vital tooth does not afford the security that is required, especially when anchored at both ends, on account of the mobility of the teeth in their sockets. In devitalized teeth, where pins can be used, there is no objection to the inlay, provided a fixed bridge or appliance is advisable.

In the fourth set of conditions, where these two abutment teeth may be in any state of decay and broken down conditions, the fixed type of bridge is more permissible, but even then my preference is given to the detachable type, particularly if there are conditions elsewhere in the same jaw that are likely to need attention in the future.

## Prosthodontia

Fig. 8 shows the abutments of a detachable bridge in place on the roots of teeth that would have been too frail to admit of filling.

Fig. 9 is an outside view and Fig. 10 is an inside view of the bridge in place on the abutments.

Fig. 11, Fig. 12 and Fig. 13 show another case and set of conditions before and after treatment. The bridge is detachable; the illustrations

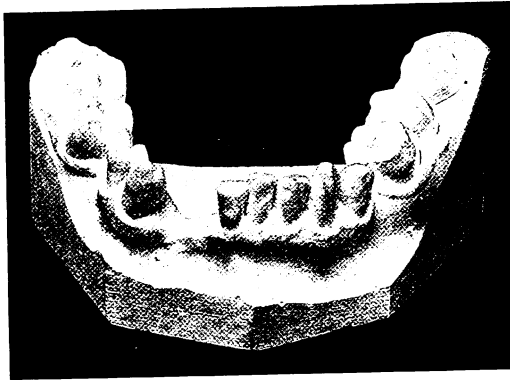


Fig. 11.

are largely self-explanatory. Briefly, the original condition resulted from loss of molar and bicuspid in early youth and the loss of cuspid and lateral in a football accident later in life. The lingual inclination and forward tipping resulting from the first losses made it necessary to raise the occlusion with the bridge abutments on the molars.

In cases where two or more teeth are missing, and with a consequent increase in length of span, the need of additional support to lessen the vertical, external and oblique stresses of mastication upon the abutment teeth becomes more imperative. In this connection I shall use a word which I think all of you will understand, and say that the dynamics of bridge abutment anchorages, *i. e.*, the forces and the directions in which they are exerted upon the abutment teeth and their roots by the bridge attachments need the most careful consideration and forethought in planning a restoration to give the maximum of service.

The type of attachment is a most important part of this, for of a number that may be used for the attachment of a bridge only one may be advisable for a particular condition. The saddle of the detachable bridge very materially reduces the vertical and lateral strains upon the abutments in a unilateral restoration, and even more so in a bilateral restoration. As losses occur by groups and singly in different parts of

the arch, conditions become more complicated, and in general it may be said that, as the extent of the replacement increases, the arguments for the removable bridge become stronger and more convincing. In extensive cases it has been my habit to make a set of models for study and

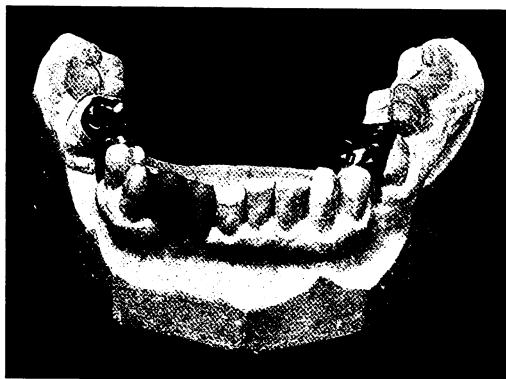


Fig. 12.

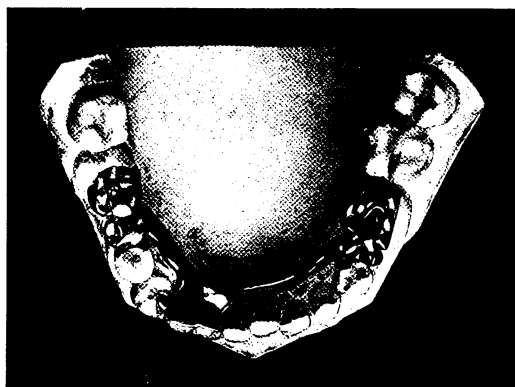


Fig. 13.

as a record of the case; these are examined and a tentative plan of action decided upon, subject to modification as new or unforeseen conditions develop in the progress of the work.

In planning work, the state of the patient's general health, age, the state of the mouth and gums, the number of teeth lost, the number remaining, their positions, size, general direction individually and collectively, freedom from caries, their occlusion or articulation with the

## Prosthodontia

opposite arch, and the degree of recession, must all be taken into consideration, particularly in selecting the kind of attachments to be used.

Prosthetic work, properly performed, is, I dare say, more exacting than operative and not nearly so pleasant, but it has always been my



Fig. 14.



Fig. 15.

conviction that this work is not generally done with the interest and care that is devoted to operative work, and is not planned as it should be in connection with operative work. This should not be so, for it is almost as easy to give consideration to the needs of prosthetic restoration while doing a piece of operative work as it is to plan and complete the operation without doing so. There are exceptions among the rank and file of dentists, but generally there is much room for improvement in the character of service rendered to a patient without necessarily making prosthodontia a specialty. A patient who has lost a number of teeth is in need of more sympathy than one who needs a great many fillings, and if there is any time when we are called upon to exercise the very best thought and judgment it is in these cases. It is more than a matter of appearance, it is nutritional and involves health considerations that are paramount, and for those ends it is necessary to retain, within reasonable

limits, everything in the way of teeth or roots that can be of use, as long as they are not a menace to the adjoining teeth and the general health. I have seen some most remarkable and pleasing results in dealing with some of these unpromising cases.



Fig. 16.

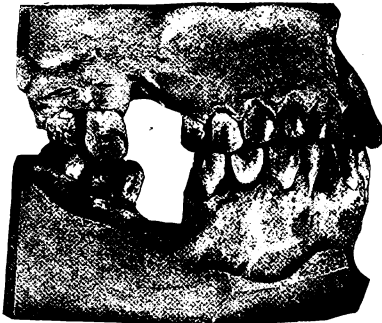


Fig. 17.

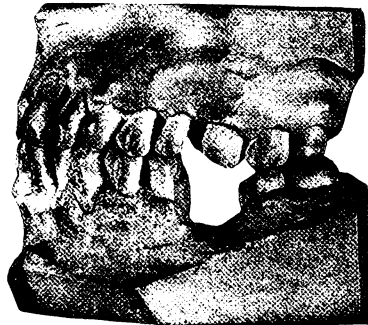


Fig. 18.

Fig. 14 and Fig. 15 are interior and posterior views, respectively, of five anterior lower teeth, yoked together. They were and are pyorrheal in their condition. Before treatment the teeth spread out like the petals of a sunflower. Extraction had been advised. They were drawn back into position with an appliance and ligatures, devitalized and united firmly with a fixed appliance, yoke, splint, interdental support, multiple staple, or whatever you choose to call it.

Figs. 16, 17 and 18 are anterior and right and left side views of another pyorrheal case before treatment. Gums anæmic, teeth loosened and out of position. Extension, devitalization, filling yoking and bridge-work was necessary. Unfortunately, through change of residence, I have not been able to make models of the treatment of this case, with the



exception of the yoke on the three lower incisors remaining, which also carries the restoration for the missing lateral. Fig. 19 is the labial and Fig. 20 the lingual view of the lower incisor.

The work that is involved is, as a rule, exceedingly exacting and unpleasant, but in this matter of service it has always been my feeling that we should give to the patient the same interest, the same services, with the same considerations, and in the same manner and spirit, that we would expect to receive if we were in the place of the patient. That has been my own aim, and there have been no deviations from that course for any consideration of expediency or of personal convenience. To be



Fig. 19.



Fig. 20.

absolutely fair and just in what we do for those that we serve professionally will not only keep the individual standards of work high, but retain to the American dentists the prestige which their thoroughness and resourcefulness and the efficiency of their work in general has won for them.

More is possible to-day than has ever been in all branches of dentistry, and particularly in prosthetic dentistry; specialized and perfected instruments, new and better methods, with the large number of modifications and combinations that are possible, make our work easier, better fitting and more efficient. The principles that Dr. Bonwill and Dr. Peeso have originated and the technique of casting gold and its adaptation to dentistry by Dr. Taggart place in our hands almost unlimited possibilities for the most conservative kind of dental work.

#### History of an Important Case.

Figs. 21, 22 and 23 show the anterior and the right and left views, and Figs. 24 and 25 the palatal and lingual views of the upper and lower arches, respectively, of the original condition of the case to which I referred in the beginning of my paper. It was taken up January 4, 1912, and was finished September 16, 1913.



## Items of Interest

As an actual representation of the evil conditions that can follow in the trail of bad practice in the ordinary and every-day operations of operative and prosthetic dentistry, this case is one of the worst. Criminal negligence about expresses one's first thoughts in viewing it, and there is ample justification for this view, because most of these conditions were preventable. They are not chargeable to the indifference of the patient, for she was neither careless nor delinquent; she went regularly to her dentist, was able to pay and did pay for supposedly good treatment. So far as my information goes, there was not a single redeeming feature for the character of the work in the circumstances surrounding the case. From my first acquaintanceship with it there was only one agreeable feature for me: the optimistic disposition of the patient, whose patience and sunny good temper rarely ever gave way in the most trying circumstances, and helped more toward improving conditions than any confidence in my own ability to bring the mouth back into a state of better health, greater efficiency and a more pleasing appearance.

At the first visit she told me that for a year or more there had not been a week at a time when she did not suffer pain in greater or less degree, or had one of the several fistules discharge into the mouth. Some of the teeth were sore to the touch, some were subject to thermal shock, and the vulcanite partial plate which she was wearing caused almost continuous soreness at one place or another. She could neither bite nor chew her food satisfactorily and had frequent attacks of indigestion. Even in speaking she experienced discomforts that were due entirely to this abnormal state of her teeth.

The condition was too much to grasp at a glance, so I made models of the case, and in the very first operation, that of making impressions, the difficulties that would have to be met and overcome became apparent. The mouth was small and the surrounding tissues inelastic. On the lower left side there was an adhesion of the cheek by a fibrous cord to a point near the second molar, which formed a kind of pocket with the cheek.

The models made from the first impressions were a failure so far as accuracy was concerned, on account of the small size of tray and the numerous undercuts all over the mouth, but served to shape up trays suitable for future work.

Figs. 21 to 25, inclusive, showing anterior, right and left, palatal and lingual views, were made from the second set of models. In removing the tray while making the lower impressions for this set, the inside of the cheek was cut quite deeply by the edge of the tray for a distance of three-quarters of an inch near the corner of the mouth.

A comprehensive conception of the state of the mouth can better

be conveyed by stating individually the condition of each tooth as found when work upon it was begun.

Beginning at the medial line to right and left, above and below, the conditions in the mouth in question were as follows:



Fig. 23.

Fig. 21.

Fig. 22

Upper right central had a Logan crown; the pin was exposed by the decay of the face of the root and the breaking away of the cement. When the crown was removed the apical end of the canal was found unfilled and odorous.

Upper right lateral had a Richmond crown and the canal was fairly well filled.

Upper right cuspid was vital; there were large mesial and distal cement fillings.

Upper right first bicuspid was missing.

## Items of Interest

Upper right second bicuspid was vital, and had a large mesio-occlusal gold filling.

Upper right first molar had a large gutta-percha and alloy filling in what was only a shell of the enamel and was dead. Two of the canals were filled.

Upper right second molar had large gutta-percha and cement fillings in the pulp chamber, but the canals were open.

Upper right third molar was missing.

Upper left central was missing.

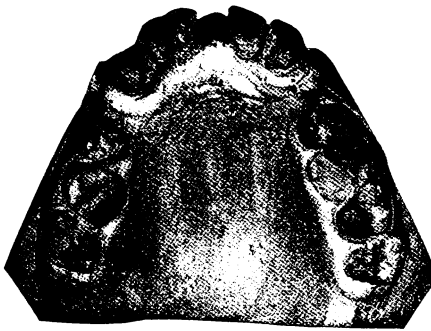


Fig. 24.

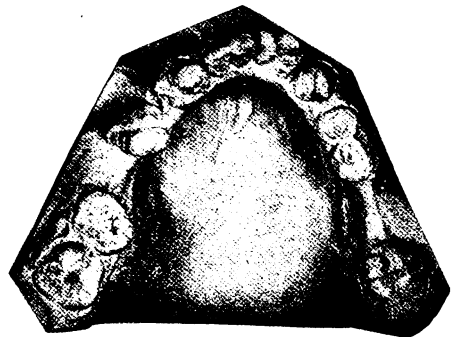


Fig. 25.

Upper left lateral had a Logan crown, cement broken out and root exposed. It had been abominably fitted. The canal above the pin and cement was also unfilled with a large apical foramen. The root had migrated into the space of the missing central and could not be used for attachment on account of its direction.

Upper left cuspid had a Logan crown, also badly fitted and off to one side.

Upper left first bicuspid was missing.

Upper left second bicuspid had a mesio-occlusal gold fill and a distal cavity, but was vital.

Upper left first molar was broken down on the palatal side to the gum line. It had a cement filling in the pulp chamber and the canals were filled with gutta-percha.

Upper left second molar had large buccal and disto-lingual alloy fillings, but the tooth was vital, the pulp much receded and full of nodules.

Upper left third molar had a large occlusal cement filling, a deep buccal cavity and the roots had been imperfectly filled with gutta-percha.



## Prosthodontia



Lower right central had half of the crown broken away and mesial and distal cement fillings and a lingual opening. The canal was full of malodorous cotton.

Lower right lateral also had mesial and distal and lingual fillings, and the canal was also full of evil-smelling cotton.

Lower right cuspid had mesial and distal cement fillings, but was vital.

Lower right first bicuspid was decayed and broken, leaving only the lower third of the crown. The canal was filled with some sort of chalky substance.

Lower right second bicuspid was also two-thirds gone, but still vital.

Lower right first molar was missing.

Lower right second molar was missing.

Lower right third molar had moved forward and was inclined into the space of the second molar, and was vital.

Lower left central had a bandless porcelain crown, with the cement disintegrated. The apical third of the canal below the pin was unfilled.

Lower left lateral had mesial and distal cement fillings and was vital.

Lower left cuspid had one-third of the crown broken away, but was vital.

Lower left first bicuspid had only the merest shell of the root sticking in the gum, the interior had been softened and disintegrated and had to be extracted.

Lower left second bicuspid was decayed to the gum line. The canal was partly filled. The root was rotated and inclined forward and its buccal and distal sides were denuded for half of its length.

Lower left first molar was missing.

Lower left second molar had a large mesio-occlusal amalgam filling. The root canals were filled with cotton and in a putrescent state. The tooth inclined forward.

Lower left third molar had a mesial cavity, and also a disto-buccal cavity that had enlarged around the margins of an amalgam filling, but was vital.

In addition to this, there was much recession in the anterior part of the mouth and pyrrhoeal pockets. The gums were purple, and over a number of the roots showed the scars of fistulous openings. One of these openings, which was discharging at the time over the upper left first molar, was slow to respond, but when last examined had apparently healed.

After the poisonous root canal conditions were cleared up, the appearance of the gums improved wonderfully, though, of course, it cannot be expected that they will ever recover from the effects of the long.

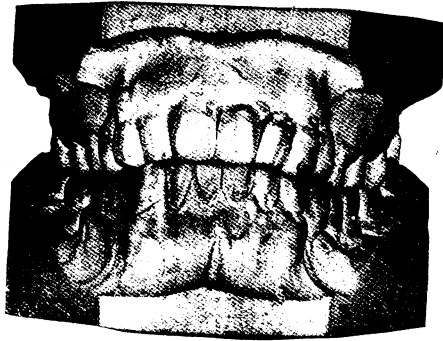


Fig. 26.



Fig. 27.

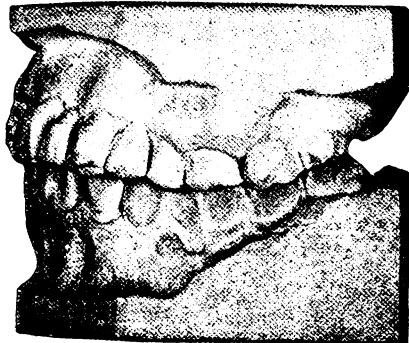


Fig. 28.

period of slow poisoning through the root canals and dentine and the effects of pyorrhoea.

At present there is not a vital tooth in the entire mouth. Every root canal was investigated, treated and filled. Those which were filled, or partly filled, were cleansed, enlarged, treated and refilled before any permanent work was done on the teeth.

As will be seen, the teeth were short and small, and this was another of the difficulties met with in getting attachments. Also it will be noticed that the anterior upper roots are inclined forward and more than ordinarily out of parallelism with the bicuspid and molars. And the curve of the plane of occlusion is pronounced.

# Prosthodontia

Now, if it is a fair question, where is there a dentist who would like to be in the place of that patient, brought up year by year to a state like that, through no fault of his own, and to find suddenly that he had evidently been badly treated? It is a serious matter, and I confidently

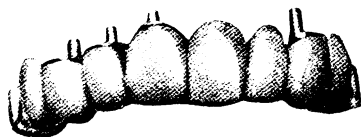


Fig. 31.

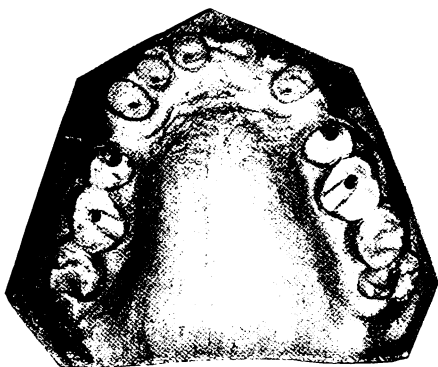


Fig. 29.



Fig. 30.



Fig. 32.

hope that, at no very distant time in the history of the profession to come, there will be a very decided improvement in the general average of the advice and service which we are giving to the people, and with more forethought and consideration for the changing conditions of the mouth.

I am making full allowance for the uninformed patient, the indifferent and delinquent patient, financial considerations, etc., and for the things which, with our best efforts, do not always turn out as we would like to have them. There are many things that we would do differently if the same case had to be done again, and the best that we can do is poor



## Items of Interest

enough, compared with what the patients need and what we would like to give them.

Figs. 26, 27 and 28 show anterior right and left views, respectively, of the completed case. I want to draw attention to the line of the plane of occlusion and the length of the bite in the bicuspid region of the lower jaw, particularly on the right side. The bite, in this case, could not be opened because of the anterior teeth, all of which were small, and because of the fact that the face, which is of the slender type, would have been made to look long and drawn.

There was also considerable natural discrepancy in the anterior part between the upper and lower arches, and though the teeth in the upper arch have been set back as far as was permissible, there is still something to be wished for in their positions and appearance.

Fig. 29 and Fig. 30 show the remaining teeth and root with the bridge abutment attachments and the crowns in the front of the lower jaw.

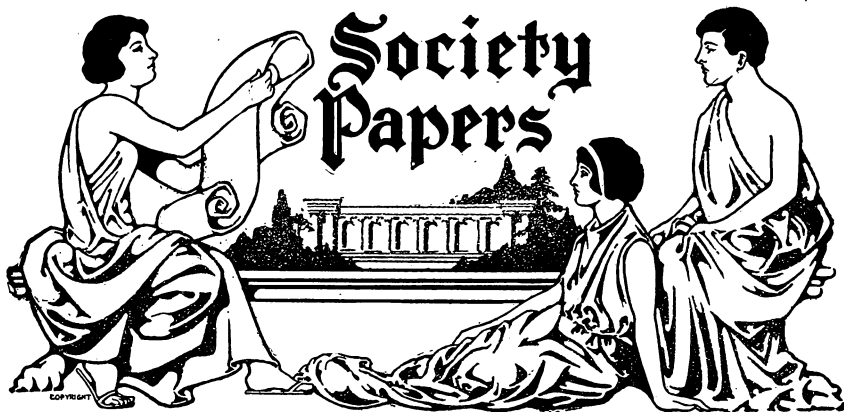
Fig. 31 is an anterior view of the upper appliance.

Fig. 32 shows the lower appliance from the front and the form of the sublingual bar that was found necessary on account of the frænulum.

The anterior view of the bridge is shown in this illustration, and the form of the sublingual bar that was found necessary on account of the frænulum.







## **Report of the Committee on Improvement of the Teeth of School Children.**

By EDWIN A. HOLBROOK, D.D.S., Brooklyn, N. Y.

*Read before the Second District Dental Society, February, 1914.*

*M<sub>1</sub>. President, Fellow Members of the Second District Dental Society, and Friends:*

Before opening the report, I want to apologize for its meagerness. The length of time which has elapsed between the closing of the last school term and the opening of this meeting, has been too short to obtain all of the records we would like, or to make any thorough investigation of individual cases.

It has been assigned to me as Chairman of the Committee on the Improvement of the Teeth of School Children to tell the purpose for which the committee was appointed, outline its work and report upon the results accomplished to date.

At the February meeting of our society, 1912, Dr. R. Ottolengui suggested that the Committee on Public Health and Education conduct a test with a selected number of school children of Brooklyn, to ascertain to what extent the removal of dental lesions would influence the development of the child mentally, morally, and physically. Dr. Stevenson, Chairman of the Committee on Public Health and Education, recommended that inasmuch as his committee had as much work planned as it could well handle, a special committee should be appointed to engage in this test. On motion, the Committee on the Improvement of the Teeth of School Children was appointed.



It was first necessary to obtain permission of the Board of Education to select children from the schools and to have access to their records. This permission was obtained through the passage of the following resolution by the Board of Superintendents, the Committee on Elementary School concurring:

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*"Resolved, That permission, as requested by the Second District Dental Society of the State of New York, to examine the teeth of children in public schools of the Borough of Brooklyn, and therein to treat cases of defective teeth, be and is hereby granted, provided the parents give their consent in writing, and the work of carrying out the plan of said society shall in no way interfere with the regular school exercises, and all services rendered shall be without cost to the children, their parents or the Department of Education."*

---

In order to make a proper selection of children and obtain physical records, it was important that we might have the co-operation of the Department of Health. Through Dr. S. Josephine Baker, Chief of the Division of Child Hygiene, we were assured that everything possible would be done to facilitate our work.

Dr. R. H. Willis, Borough Chief of the Division of Child Hygiene, took a personal interest in the test from the start, and has made the accurate health records possible.

The next step was to enlist the services of dentists to treat the children. Eighty-three volunteers promptly responded. Each dentist agreed to fill all cavities of decay as quickly as possible and keep the child's teeth clean and in good repair for one year. Twenty-three of these men also volunteered to assist in making the selection of cases in the schools.

Twenty-three convenient schools were chosen. The Medical Inspectors in these schools were instructed to select a number of children, ranging from eleven to thirteen years of age, with defective teeth, who were below normal mentally and suffering from malnutrition. Care was taken to exclude cases which had physical defects which would not be influenced by oral conditions.

From these children the dental examiners selected three hundred and twenty-seven (327) as being good subjects for the test.

The following letter was sent to the parents of each child:

---

*Dear Sir or Madam:*

The Second District Dental Society of the State of New York has obtained permission from the Board of Education to carry on a test



among the school children of Brooklyn, for the purpose of demonstrating that diseased teeth and unclean mouths have a retarding influence upon the development of the child, both physically and mentally.

The children selected for this test will have their teeth filled and cleaned and kept in repair for one year by some of the best dentists in the city.

The members of the Second District Dental Society hereby respectfully ask your permission to treat your child's teeth. This work is to be done without cost to you, in accordance with the plan agreed upon between this society and the Board of Education.

You will please help us in our effort to make your child's mouth and teeth healthy and clean by having him or her go to the dentist appointed by us promptly at the time set. This will greatly aid us in obtaining the results for which we are striving.

Please sign and mail the enclosed card at once.

Very respectfully yours,

THE COMMITTEE.

E. A. HOLBROOK, D.D.S., Chairman.

W. S. WATSON, D.D.S.

V. A. STOLTZE, D.D.S., Secretary.

We obtained the parents' consent for two hundred and forty-three (243).

On December 1st, 1912, one hundred and sixty four (164) children were assigned to the various dentists, care being taken to send each child to the nearest office. This done, the committee was congratulating itself upon having overcome most of the obstacles in the path of the work, when our several phones began to give out protest from dentist after dentist as the children failed to keep appointments. We had reckoned without the child! Some of these refused to appear for treatment because the dentist was too far; others for the same reason that a great many perfectly normal and intelligent people would give.

Children who did not keep appointments were dropped and others assigned in their places. When this happened several times to one dentist he withdrew, thus cutting down the number of cases we could handle.

In the first assignment, children were selected from our list who had the poorest records. Consequently, when any of these were dropped, their places were taken by children in whom it would be more difficult to make an improvement.

We have been confronted by the same difficulty that invariably obtains when a body of unrestrained children are under observation for the purpose of compiling statistics, namely, the lack of control over the subjects in the test.

## Items of Interest

When the final tally was taken one year from date of the original assignment, we had ninety-three finished cases which were treated by sixty-two dentists. These cases were all finished prior to July 1, 1913. Of these ninety-three, eleven children have moved out of town, or left school for other reasons, leaving eighty-two (82) upon whose records we are to form our deduction. A number of the children have been transferred from one school to another, and these eighty-two children are now scattered through thirty-two schools in this borough.

The class records of these children in attendance, studies and deportment for the term preceding the treatment of the teeth have been obtained from the respective school principals. Each child also had a thorough physical examination before treatment by the Medical Inspectors of the Department of Health.

The same class records have been obtained for the school term of five months, ending February 1, 1914. This term immediately followed the completion of dental operations. The second physical examination was made in January, 1914, six months after completion of treatment.

The committee is of the opinion that the records which we will obtain at the end of the present term will be a better index of the values of the services rendered.

It may be of interest before proceeding to an examination of the records of the children to hear what operations the dentists found it necessary to perform.

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Amalgam fillings .....	370
Gold fillings .....	4
Gold inlays .....	25
Copper cement .....	16
Zinc cement .....	45
Gutta percha .....	7
Copper amalgam .....	4
Silicate cement .....	47

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Total fillings .....	518
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Teeth treated root canals filled.....	70
Crowns .....	7
Permanent teeth extracted.....	76
Temporary teeth extracted.....	83
Cleanings .....	93
And frequent prophylactic treatment.	



The following are names of the dentists who treated the cases:

Dr. E. A. Babcock.....	2	*Dr. I. U. Miller.....	1
" A. P. Boudin.....	1	* " F. H. Miller.....	1
" C. A. Bush.....	1	" E. E. Megaw.....	2
" H. C. Croscup.....	2	" A. H. Merritt.....	1
" W. T. Carpenter.....	2	* " F. H. Nies.....	2
" R. W. Collins.....	2	" C. W. Orr.....	2
* " H. M. Childs.....	1	" R. Ottolengui.....	3
* " R. H. Clark.....	2	" P. E. Phillips.....	1
" C. R. Dayton.....	1	" C. B. Parker.....	2
" G. E. Davis.....	1	* " W. H. Rogers.....	2
* " L. C. Edwards.....	1	" F. C. Royce.....	2
* " W. N. Frazer.....	1	" A. Ritt .....	1
" J. A. Glenzer.....	2	" P. R. Stillman.....	1
" J. A. Gelson.....	1	" V. A. Stoltze.....	2
* " G. Gardner.....	1	" W. Steinbuch .....	2
" T. P. Hyatt.....	2	* " A. H. Stevenson.....	2
* " E. A. Holbrook.....	2	* " S. Shapiro .....	1
* " B. L. Hoch.....	2	* " E. K. Sexton.....	1
" J. Husch .....	1	" R. H. Sanderson.....	2
" E. Hillyer .....	2	" B. Shapiro .....	2
* " G. B. Johnson.....	2	" E. A. Toshack.....	1
" W. H. Johnston.....	2	" W. W. Thompson.....	1
" H. A. King.....	1	" E. P. Washburn.....	3
" J. F. Lief.....	1	" F. C. Walker.....	1
* " C. H. La Borne.....	1	" C. B. Whitcomb.....	2
" O. S. Long.....	1	" O. F. Wolf.....	4

I will not attempt to read off the records of each individual case, but will confine the report to totals, believing that presented in this way a more comprehensive understanding of the results accomplished will be obtained.

Dr. A. H. Stevenson, Chairman of the Committee on Public Health and Education, who has been co-operating with this committee from the first, will present a few individual cases of interest later.

No. of cases completed with all records available..... 82

All sub-normal children when selected.

The following tabulation was made from signed forms forwarded by principals:

\*Signifies men who help make selections of cases in school.

# Items of Interest

## GENERAL AVERAGE STUDIES.

No. of cases improved.....	45
(Or 55% of total.)	
Average increase per child.....	10¼%
No. of cases remaining same.....	10
No. of cases retrograded.....	27

## DEPARTMENT.

No. of cases improved.....	28
Average increase per child.....	14%
No. of cases remaining same.....	39
(Most of these were graded A.)	
No. of cases retrograded.....	15

## DAYS ABSENT.

Term before treatment .....	586	days
Term following treatment .....	511½	"

A decrease of .....	74½	"
Per cent. of decrease.....	12½%	

Term before treatment 20 children below 70%, or general average necessary for promotion.

Term after treatment 14 children below 70%, or general average necessary for promotion.

A decrease of 30% in left-backs.

Of six children who were in special classes for backward pupils before treatment, five are now in regular grades and doing very satisfactory work.

## HEALTH RECORDS OF CHILDREN IN TESTS PREPARED FROM RECORDS OF BUREAU OF CHILD HYGIENE OF THE DEPARTMENT OF HEALTH.

Cases originally selected .....	327	
Parents consents refused .....	84	cases
Broken appointments .....	71	"
Left school, no health or school record or other- wise undesirable .....	93	"

248 "

Cases completed and health records available.....	79
No. cases of malnutrition before treatment.....	41
No. cases of defective hearing before treatment.....	2

## AFTER TREATMENT.

Malnutrition cases improved.....	22
" " cured .....	17
Ninety-five per cent. cured or improved.	
Defective hearing cases improved.....	2



We have endeavored to make this as nearly a normal test as possible, having relied entirely upon the class work of the children for records. The teachers, for the most part, have not known that certain children were under observation.

The children have not been bribed into being more industrious, neither have they been held to the test by offers of reward.

The only change we have made in their daily routine is in the introduction of the tooth brush, dentifrice, the dental floss, with careful instructions for the use of same.

The committee desires to express its appreciation of the hearty co-operation of the school authorities, Health Department officials and the dentists.

The committee respectfully submits the results herein contained to those who follow in discussion to determine whether or not the removal of dental lesions and the strict application of mouth hygiene have helped to increase the efficiency of the pupil.

We present our findings in the hope that they may show wherein the difficult path of the sub-normal child may be made easier, and the child continue through school without handicap, acquiring its proper quota of knowledge and development.

EDWIN A. HOLBROOK, D.D.S., Chairman.

WALTER S. WATSON, D.D.S.

VAL. A. STOLTZE, D.D.S.

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## **Painless Dentistry.**

By ROBERT H. M. DAWBARN, M.D., New York City.

*An address delivered before the American Academy of Dental Surgery of New Jersey, Friday, October 31, 1913.*

**Dr. Dawbarn.**

I feel particularly at home among you. For the first two years of my professional existence my time was devoted to the study of dentistry under the late Charles D. Cook, of Brooklyn, where I made many sets of artificial teeth, and made them very badly; but I have never lost my interest in your specialty, and for some fifteen years I was an honorary member of the Institute of Stomatology, of New York, and I have always made surgery of the mouth a particular specialty.

In being asked to address you to-night I could think of nothing that would appeal more to you than the subject of painless dentistry, and I hope you will forgive me for not having put it in written form, because



## Items of Interest

I am in the habit of speaking extemporaneously, and I prefer to look my audience in the eyes.

I believe you will agree with me that the profession has to face a new phase of affairs in the growing neurotic state of the American people, for more and more do they suffer from pain than formerly. I happened to be present when Mrs. Eddy's dentist remarked that he never filled her teeth without her repeatedly saying to him, "Be sure to use plenty of cocaine." Of course, there was no pain, but she knew when to ask for cocaine! But the American public as a whole are becoming more and more sensitive to pain, and dentists who recognize this and determine to do their work painlessly will reap a great reward.

I purpose to divide the ways in which this can be accomplished under four heads.

First, as to the psychological way. You know as well as I there are many people who simply by their personality and the way they approach the subject can accomplish their work with one-half of the misery that others are obliged to cause.

Second, as to drugs—and they may be administered in certain ways which I will take up later.

The third method is by electricity, used as a vehicle chiefly for drugs. And fourth and last, the wonderful recent development of light as a pain-obtunding agent.

### **Use of Drugs in Painless Dentistry.**

As to drugs, perhaps nothing has been used more frequently in excavating painful teeth than applications of saturated cocaine; and the reason it is not more effectual, as doubtless most of you know, is because cocaine does not work proximally, but only distally. If I were to inject a strong solution of cocaine in contact with the ulnar nerve at my elbow, in a few minutes I could cut off my little finger and not feel it. I could cut into that nerve painlessly at any point distal from the injection; but if I attempted to do it proximally, even the most trifling distance, it would hurt terribly. That is why the first stroke of your excavator takes off the part that has become benumbed, and, because the effect of the cocaine does not work backward, your patient is then as badly off as before. But that is not the proper way to use cocaine. The method in the future for the individual tooth I think without any question will be and is in the hands of a great many men now, the use of a platinum-pointed, very delicate, hypodermic needle, capable of being curved in various shapes, and which can be carried down along the curve of the root to the very tip. There make your main injection, but inject a little as you go along, and then the operation may be made painlessly. Cocaine is being used comparatively



little now in general surgery because of its relative danger. Yet a great many more patients are having local anesthesia where formerly they had major anesthesia. Locally, perhaps, as good a remedy as I can recommend to you is novocain with a little adrenalin in it. Fifteen minims, dissolving one ordinary tablet, corresponds with the ordinary dose, making a two per cent. solution; and you can inject four or five or six times that amount if you wish to without any danger. If you want a more permanent effect, lasting longer than an hour or so, then you would use quinine hydrochloride with urea tablets for hypodermic use, of from one to three grains. This has a wonderful power of retaining analgesia, benumbing sometimes for as long as a hundred hours. A patient came to me a couple of weeks ago with inflamed external hemorrhoids. A friend of mine, who has been quite a great "pile driver," remarked to me once that this is the only operation he does without ever asking the patient's consent, *i. e.*, simply to open the external pile and turn out a blood clot as black as ink, which is regularly the cause of the trouble. My patient, however, would only permit palliative measures; but I had to use something there, and injected urea and quinine hydrochloride into the base of the pile, and that was the end of his discomfort. Its inflammation came to an end before feeling was restored, some three days later on.

This drug combination is nothing new in the profession. When I was a medical student in '79 and '80, I saw Dr. Loomis in New York use it in treating malaria, and read of Dr. Shoemaker, of Philadelphia, using the same thing, and also Dr. William H. Thompson, of New York, now ex-president of the Academy of Medicine. The reason why urea is used is that the urate of quinine is by far more soluble than even the bi-sulphate. The surprising thing is that none of these keen, able observers who injected it thirty odd years ago noticed that the skin was left benumbed, and applied the discovery to surgery!

In 1887 or thereabouts they began to use cocaine, and before then if a man got a sliver or a cinder in his cornea he had to be put under ether very deeply—enough so to have done a major amputation—yet a drop or two of this solution on the cornea would have enabled them to do the removal painlessly.

I could give you a long list of drugs used for the purpose of benumbing pain. What I use in spinal analgesia is tropacocain. If this has not been used in dentistry, it is high time it was at least tried. It is given by me in the spinal canal—the lumbar region—two grains dissolved in a drachm of normal saline solution, and will produce perfect analgesia from the waist down, lasting on an average one hour at least. Its advantages over cocain are, first of all, that it is very much less



poisonous. Two grains of tropacocain only equals about one-third grain of cocain. If you inject cocain intra-spinaly, you will have vomiting almost always and within a half-hour, and you never get it with tropacocain. When you use cocain you cannot boil it without decomposing it; tropacocain you boil without hurting it, the object being, of course, to sterilize its solution. Its only objection is its expense. It comes in packages of about fifteen grains each, and is rather costly. There are only one or two places in New York where you can get it. I get mine from Merck & Co. Cocain comes from the Andes Mountains in South America. We get tropacocain from the small leafed coca plant of Java; and it is also made synthetically.

Many years ago I devised a method of producing local analgesia in dental work, which was published in the "*Proceedings of the Stomatological Institute*" some fifteen years ago. It is intended for use when several teeth need otherwise painful work at one sitting, such as cleaning the roots, in advanced Riggs disease, as a single instance. Take a syringe such as my spinal syringe (exhibiting syringe), with a needle like that of a hypodermic, only much longer—

In intra-spinal work, how close can you approximate to the spinal medulla with your needle without danger?

**Dr. B. Holly Smith.**

The spinal cord, you will remember, does not exist in the lumbar region—unless you dignify by that name the *filum terminale*, which covers only the first lumbar vertebra. You are safe to enter your needle in any part of the lumbar region, for you are entering below the spinal cord.

**Dr. B. Holly Smith.** But you sometimes go into that spinal column where you know the cord is, do you not?

That has been done, but it is poor technique; you are liable to injure the cord, and I have never gone above the lumbar region. The subject is such a big one that it is not worth while now to go very deeply into it.

But this particular needle of mine is made with a very short bevel, and is ground at the end with the tightly fitting trocar or wire in place, so that the end looks solid, until the wire is withdrawn. Thus, and by reason of having the needle only begin its real journey at the bottom of a bistoury puncture through the skin, we avoid risk of conveying particles of skin with its microbes into the spinal canal.

The technique of spinal analgesia is a subject by itself, and I cannot go into it deeply now, unless you want me to. When it was first brought out a good many mistakes were made, as in the early days of the use of chloroform. Most of the doctors were scared off, and only two

surgeons in New York continued its use to any thorough extent, namely, Dr. Bainbridge and myself. Together with various operators in other cities, we found out what the mistakes were and learned how to avoid them, and in my list of nearly seven hundred cases I have never had occasion to regret using it, although in a few of those cases I had trouble in finding the spinal fluid, or did not succeed in doing so.

**Dr. B. Holly Smith.** Do you never find paralyses following your operations?

**Dr. Dawbarn.** Not once. Dr. August Bier, of Berlin, who, after Dr. Leonard Corning, of New York, was the discoverer of it, after using it several hundred times, says that, in his opinion, it is "the safest of all forms of anesthesia." In the Massachusetts General Hospital it has been used almost exclusively for several years in all urino-genital work. If Leonard Corning had been a British doctor he would have been knighted and a pension would have been secured for him. We, as a people, are very ungrateful in that respect toward our discoverers.

To return to our subject, the benumbing of one or other branch of the trifacial nerve to the teeth by hypodermic injection: To affect the inferior dental, controlling it from a point just before its entrance into the canal in the inner surface of the ramus, you open wide the mouth and thereby have abundant space in which to pass your long hypodermic needle in, between the zygomatic arch above and the sigmoid notch of the mandible below. You inject the analgesic agent very close to the nerve, and the effect will last for an hour, or perhaps less, with ordinary benumbing agents; if you combine some urea and quinine hydrochloride with it, it will last a much longer time. That is for the lower jaw—upon one-half of it. But if you want only to affect the lower incisors and the canines and the first bicuspid of one side, you inject it in the mental foramen, right under the second bicuspid tooth.

**Dr. B. Holly Smith.** You strike an artery there.

**Dr. Dawbarn.** An ordinary hypodermic needle is so small that you need not worry on that score. But it is probably less trouble to benumb the whole inferior dental nerve as first mentioned.

Then for the upper jaw, for the four upper incisors, if you take a two per cent. cocaine solution and moisten absorbent cotton, the size of a dime, with it, and press that against the floor of the nose, you can in a quarter of an hour usually extract these four teeth without pain.

The cocaine works in that case upon the roots of the nerve; it does



not work backwards, but it does work distally, carried by the circulation down through the anterior nasal canal.

Again, you know that practically all of the teeth back of the first bicuspid in the upper jaw abut against the floor of the antrum of Highmore, and the natural opening of the antrum into the nose is in the middle meatus, where it can usually be seen and probed on its outer wall. This opening being at the junction of roof and inner wall of the antrum, it follows that when pus or irritant mucus forms in the antrum the only way it can drain without surgical intervention and drilling is by the person standing on his head! The human body is full of anatomical blunders—nor am I the originator of that remark. I could give you many instances of the most ridiculous anatomical mistakes made by Nature. The only logical excuse for the appendix, for instance, is that it has been a kind friend to us surgeons! There is no excuse for the existence of the gall bladder—the horse, the elephant, the ass, the rhinoceros and the true deer have no gall bladders, and they enjoy perfectly good health without it, as do those who have it removed. And this is equally true of those who have been deprived of tonsils or adenoids, which are (when enlarged) enemies, not friends, in the economy. Again, what would be thought of a cooper who would make his barrels with the staves on the outside and the hoops on the inside? Such work would obviously not be best for standing strain, and yet Providence has made every one of the tubes or ducts opening into the alimentary canal with this relative position of the longitudinal and the circular muscular layers. These are but a few among numbers of instances known to all anatomists.

Now, coming back to the subject, I was indicating various ways by which you could benumb several teeth at once. You can usually pass into the antrum, through its natural opening, a long, blunt-pointed, curved, hypodermic needle, and through it fill the antrum with any fluid agent you please. But if you prefer using a short, strong needle, you can readily pass it through the wonderfully thin front bony wall of the antrum, just above the gum, and by this route fill it with numbing solution—to be withdrawn similarly afterwards, your work being finished.

Now I want to take up another phase—electricity. And I think I was first to suggest, many years ago, the use (but not the name) of what has been called “electric cataphoresis”—that is, charging the positive electrode, that is, the anode, with an analgesic agent, non-colloid, in solution, by the shortest route, *i. e.*, from the positive electrode thus saturated to the negative, or cathode, through the part you want to treat.

**Electricity in  
Painless Dentistry.**

**Eight in  
Painless Dentistry.**

Now in regard to light. Here we have a new field that possibly not all of you gentlemen have had the time to keep up with. For instance, how many of you are familiar with the Menin Light? Dr. Menin is at present the surgeon-general of the Russian Army, and he found this form of light a great improvement over the Finsen rays. His light is in use at the present time in most of the European armies, even including that of Japan, their enemy, whenever they want to do some slight operation painlessly or probe a wound or pass stitches, etc., etc. It has been used for the last few years in the London Dental Hospital for the extraction of teeth painlessly, whenever the patient has time enough to submit to have the light play on the gum for from a quarter to half an hour. It is an exemplification of the effect of that wonderful thing—commonly spoken of in works upon light-therapy as the “Precious Rays”—the ultra-violet rays. I had occasion to use it a few days ago upon a patient suffering from lumbago, who had been in agony for a week or ten days, and everything else had been applied that could be used. It is not the heat that produces the effect, for it is held far enough away to avoid this. In this case it was allowed to shine on his back all night, and in the morning that man got up and took some pennies out of his trouser’s pocket and dropped them on the floor, and went around picking them up, just for the pleasure of being able to stoop down and get them without pain! This light is of a deep purple shade, the globe being as large as an orange, or larger, and is used with a reflector of aluminum, elliptical in shape, and can be clamped to a little iron stand, which can be fixed at any angle, and the necessary connection be made by an ordinary plug and cord to any electrical wall socket. This apparatus comes to somewhere about twelve dollars, and can be bought at various places. I procured mine from Beck & Co., at Hammond, Ind. It is called Menin’s light. It is not very rapid in operation, but when you have time to have it play on a gum for half an hour you can extract a tooth painlessly, or can thus stop a tooth-ache. It cannot do any harm, and they are using it, as I am telling you, at the London General Dental Hospital.

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**An Appeal for Better Amalgam Restorations.**

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By WILLIAM R. POND, D.D.S., Rutland, Vt.

*Read before the Third District Dental Society of the State of New York at Albany,  
March, 1914.*

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When we take into consideration the fact that fully seventy-five per cent. of our filling work is done with amalgam, the importance of this

material to our profession and to the patients under our care can be more fully realized. With this realization there is bound to come home to us the necessity for a better understanding of this filling material and for an improvement in the technique of its use in dental operations. Also when one observes the careless and slipshod methods employed at times in the use of amalgam and the little understanding there seems to be of the material itself, he is bound to realize the fact that this department of operative dentistry has been sadly neglected. It is to the credit of this society that this important and much neglected subject is being given consideration at its meetings. When a man of Dr. Black's standing and experience states that the amalgam filling is more difficult to make perfectly than the gold, and when Dr. Grieves designates amalgam as "a material that to-day is saving more teeth than any one material in our hands," I feel justified in saying that this is one of the most important subjects before us. We are saving more teeth with amalgam than with any other filling material, and this in spite of the many cases of faulty technique and poor alloys. Imagine what we can accomplish when we perfect our operative procedure and when we have the perfect alloy.

**Choice of  
Alloys.**

Let us take up first the question of alloys. As your essayist of last fall, Dr. Crandall, gave a very complete description of alloy making, formulas, ageing, annealing, stress and flow, etc., it seems unnecessary to go into detail on that phase of the subject, except as regards some matters which are still open to discussion.

The alloys most generally used and accepted at the present time are those made from Dr. Black's formula, and the principal contention seems to be regarding the advisability of adding a small amount of zinc (about two per cent.) to the silver, tin and copper constituents. You have been told that the addition of zinc is not permissible in an alloy, and the same statement was made by Dr. Black several years ago. Having used for fourteen years an alloy containing a small trace of zinc, and this alloy having given satisfactory results, I prefer to have this matter absolutely proved before believing that a small trace of zinc added to the Black formula is not advisable. Dr. Marcus L. Ward says: "Arguments against zinc would hold true if we were considering zinc alone, but why treat zinc as an individual metal when we are discussing alloys any more than we would silver? We can point out some objections to silver if we desire to do so, but no one seems to think that there are any reasons why it is not desirable." Allow me to quote Dr. Ward again when he says: "The real objection to the use of zinc in alloys for amalgam is that those alloys containing it seem to expand more than those without it, and my attitude is to control these expansions by more intelligent manipulation

(if the manufacturers are unable to control them in the manufacture of the alloys), and by so doing avoid taking a step backward to the alloys of forty or fifty years ago, many of which were as black as coal in some mouths." Personally, I consider the color of amalgam fillings an important question, and until scientific, unbiased tests show zinc to be a mischief maker in alloys I shall continue to be in favor of the alloys containing a small percentage of this metal.

Before leaving the subject of formulas it might be well to mention briefly W. W. Atkinson's alloy,  $\text{Ag}_2 \text{ Sn Cu}$ . This formula is based on the theory that the metals are combined chemically in the ratio of their atomic weights. Mr. Atkinson claims that amalgams made from chemically combined alloys do not discolor, for the electrical and chemical affinities are satisfied. The chemical theory of alloys does not seem to meet with general acceptance, and, at least for the present, the contentions in favor of this formula must be entered as not proven.

**Balanced  
Alloys.**

Now as to balanced alloys. At the present time the balanced alloys are doubtless the best and most accurate that we have. But to contend that this method of preparing alloys is scientific is rather far fetched, and Dr. McCauley's statement that "The method of making and balancing alloys as discovered by Dr. Black is the only scientific and dependable method which has been introduced up to this time," would rather lead one to wonder how scientific, how accurate and how valuable were his tests made with the commercial alloys. Dr. Black says: "If it were possible to use chemically pure metals, a fixed formula would be possible," and he also adds, "But such metals would be too expensive for use in dentistry." Dr. Crandall says: "Speaking accurately, there are no alloys which are perfectly balanced." Surely, if these statements are correct, the word scientific could not be applied to the method of balancing alloys. The balanced alloys are doubtless the best and most accurate that we have at present, but one cannot but be impressed with the fact that we need real scientific investigation and research to prove or disprove many statements regarding alloys and amalgams; and if we can get scientific formulas by using pure metals and by accurate work, it is surely the duty of the profession to pay more for alloys if necessary. It has been stated that twenty per cent. added to the cost would procure chemically pure metals, and this small advance certainly would not make alloys prohibitive in price. It is safe to say that the reputable alloy manufacturers are as anxious to produce good alloys as we are to have them. If we refused to use the poor and cheap alloys they would soon cease to exist. It is the dentist and not the manufacturer who is to blame, for the manufacturer is only supplying what is demanded of



## Items of Interest

him. And here let me say that the manufacturers know more about alloys than do the dentists as a whole. It is a wonderful thing to consider the ignorance of the profession regarding the filling material which is used in seventy-five per cent. of the operations of filling teeth.

When we come to operative procedure we find many points of difference between operators, but ideas regarding the great fundamental principles, such as cavity preparation, restoring proper tooth forms and occlusion and things of like nature are bound to be similar. Nowhere is the Black system of cavity preparation more applicable than in amalgam work, and with few variations, which I will mention, this form of preparation thoroughly covers the ground. The bevel at the margins should be very long, giving a sharp, clean-cut margin and a strong body of the filling material at this point. In spite of statements regarding the necessity for heavy undercuts and pulp chamber retention for amalgam fillings, I wish to say that little or no undercut is necessary if the filling is cemented in and the typical Black cavity preparation is used. If for aesthetic reasons any frail walls are to be left, they should be well supported by cement. This matter of leaving frail walls is decidedly a variation from the Black system, but according to my ideas is justified (particularly in bicuspid teeth) when the loss of a part of a buccal wall would cause an unsightly filling. Also by cementing in the amalgam, many hopeless looking bicuspids can be made not only useful, but at the same time fairly ornamental.

One of the principal points of operative procedure which I desire to bring out is the use of cement in conjunction with amalgam. Those who have never used this method are depriving themselves of one of the most satisfactory methods in dentistry, and those who have followed this procedure correctly will back me up in this statement. Having cemented in my amalgam fillings for fully ten years, I feel justified in making the statement that any healthy tooth, no matter how badly broken down, can be restored with amalgam in this way. I will qualify this statement to the extent of saying that it must be possible to apply a matrix, and if no crown is present, pins must be used. To the man who doubts the strength of these operations I would say: Try to drill out an amalgam filling which has been cemented in. He will find the amalgam must be drilled to the last flake. It might be well to say that this work is best done with slow-setting cement and a quick-setting amalgam. The slow-setting cement is non-hydraulic, and an alloy to be good must be quick-setting.



Cement used with amalgam has other properties and uses beside that of holding the filling securely. To those who wish to look into this matter more thoroughly I would recommend Dr. Clarence J. Grieves' article, "*The Cement Line in Inlays*," for many of the points brought out in his paper apply to all cemented-in fillings. Dr. Grieves says, among other things, that the cement acts as a filter, filtering the saliva of the germs in the mouth, preventing decay of enamel. Regarding cemented-in fillings he says: "The cemented-in filling of either crystal gold or amalgam is the greatest thing in dental practice to-day. The line of cement is much finer than can be made by the most expert inlay operator." Dr. Grieves has also made the statement that there has never been a contact operation that did not leak saliva at some point. Of course, we know many amalgam fillings have saved teeth and prevented a reoccurrence of decay by virtue of leaking saliva at the margin and thereby having the salts of silver form. These black, discolored lines and the discolored tooth structure are unsightly and undesirable, and can be prevented and a reoccurrence of decay prevented by the use of lining of soft cement into which the amalgam is worked. While taking up this part of the subject one cannot help wondering if it were not possible that the cemented amalgam fillings would stand Dr. Crandall's air pressure test for leakage better than did his contact operations.

**Use of Dam  
with Amalgam.**

Regarding the use of the rubber dam in amalgam operations, I wish to say that I rarely consider it indicated, provided the cotton rolls and saliva ejector are intelligently used and all things arranged for a careful but expeditious operation. Washing the cavity and margins with warm alcohol precludes contamination from the saliva and thoroughly dries the field of operation. Many good cavity preparations extending beneath the gum would be extremely difficult cases for the use of the rubber dam, and a rubber clamp would interfere with the use of a matrix. One of the principal things against the use of the dam is the necessity of *immediate* closure of the jaw to note the occlusion and particularly the movements of the mandible. This must be done at once and before the filling material begins to crystallize, at which time there is great danger of crushing and breaking down a carefully contoured filling. This danger is nil before the filling has commenced to set. The saliva does no damage to the filling material after it is in place.

**Use of Matrices  
with Amalgam.**

The use of a matrix is absolutely indicated where one or more walls are to be restored. A little cocoa butter rubbed on the matrix prevents adherence of the cement and amalgam to it. One point



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which is slightly revolutionary I would like to bring out. Except where a matrix is left on (in very large contours) until another sitting, I prefer to finish a filling entirely in the one operation. This point I will illustrate later, but will explain now that the filling burnished and finished while it is setting has a lighter, more attractive and less conspicuous color than the filling polished later with disks and strips. With scalers, files and non-cutting polishing strips the filling can be perfectly finished at one sitting.

A few points we might mention are: necessity for pure mercury and the necessity for a thorough kneading and mixing of the amalgam. Alloys high in silver mix hard. Use filings, not shavings. If the mercury is promptly wrung out, an excess in mixing does no harm. Do not mix too dry. Dr. Black says: "If because of dryness it must be forced together by extraordinary pressure in order to make it cohere, it is apt to make a brittle filling." Use sufficient pressure to make the filling a homogeneous mass. The question of instruments we will also consider at the clinic.

### **Restoration of Proper Forms.**

We now come to the point of restoring correct tooth forms, a natural occlusion, and proper contact points, some of the most difficult and necessary points in filling work. The matter of contact points has been so thoroughly gone over and demonstrated by Dr. Black that it only seems necessary to say that amalgam fillings which lack in this respect must be considered failures. This is a weak point with many of our plastic fillings, and a matter we must correct if we would save teeth instead of destroying them. In restoring natural tooth forms and occlusion we must study dental anatomy and understand occlusion. How beautiful and how efficient is normal occlusion and how well worth while it is to produce this perfect condition as nearly as is possible by orthodontic treatment and by our filling restorations. In studying dental anatomy one cannot fail to be impressed with the wonderful tooth forms nature has developed; each plane, each groove and sulcus so perfect in its detail and so efficiently arranged for practical use. How much is lost in efficiency and beauty when we fail to reproduce these natural tooth forms. How much do the polished occlusal flat surfaces of most of our fillings lack. Recent developments in cast inlay work have shown splendid possibilities of reproducing the correct detail of tooth forms in this class of fillings, and unless we can get the same results with other filling materials we should certainly not be justified in using other methods for the bulk of our occlusal restorations. One of the principal aims of this paper is to show that amalgam can be carved to produce as accurate and as artistic results as can be accomplished with the cast gold inlay. I

trust my lantern slides of clinic models and cases from practice will furnish sufficient proof of this.

In closing this paper allow me to quote again from Dr. Black, who says: "The idea that amalgam is a cheap filling, to be done quickly in 'any old way,' should be discarded forever. The dentist should have the same pay for time in making amalgam fillings as in making gold fillings, and should take the time to do it well." To this very practical thought I should like to add this: How can one consistently demand a good fee for an amalgam operation unless he is willing to use the best alloy money can buy and efficiency produce? Let the demand for cheap alloy cease. Is it not self-evident that if we use amalgam in seventy-five per cent. of our filling operations we are either seventy-five per cent. efficient or seventy-five per cent. deficient, according as we use this material? This is a serious matter, gentlemen, and I appeal to you to raise the standard of this branch of work, to spread the gospel of better amalgam restorations. Educate your patients to expect and to appreciate good amalgam work. Use amalgam, not as a poor substitute called a "silver filling," but as a wonderful filling material which, correctly used, is capable of restoring the efficiency of millions of carious teeth and thereby contributing to the health and happiness of the nation.

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### **Certain Dental Interests in the Internal Secretions.**

By GEORGE VAN N. DEARBORN,

*Professor of Physiology, Tufts Medical and Dental Schools, Boston; of the Philosophy of Physical Education, Sargent Normal School, Cambridge.*

*Remarks made March 3, 1914, before the evening class of the Massachusetts Dental Society in the Physiologic Laboratory of the Tufts Dental School.*

Dean Painter's invitation to speak to you this evening aroused hopes of demonstrating dental interests in internal secretions, but, like the secretions themselves, the interests of dental doctors in them are more often than not internal, recondite, almost, I might say, esoteric; or so in general I suspect, for most of you realize how complex and how little understood these substances really are.

My remarks will be to you very likely in the nature of a twice-told tale, for I can do as yet truly little more than switch on the current and set the pedagogic physiological mill to grinding a more or less familiar grist. For if some few of the many medical men specializing in dentistry (the so-called dentists—who else?) have of late months developed a high-voltage interest in certain internal secretions, it none the less remains true that the majority of dental specialists in medicine have their

interests in the internal secretions so deeply buried in their subterranean subconsciousness that not even the "absent treatment" of the late clever Mary Baker Glover Patterson Eddy, or the more scientific detective genius of Morton Prince, or even of Sigmund Freud himself, could discover, much less resurrect it into practical effectiveness. In directer phrase, the dental interests in the internal secretions are apparently narrow, but somewhat deep—in spots.

You will forgive me, then, gentlemen, if I yield to the true physiologist's impulse inherent in the life he studies to talk to whomever will listen—even if he have little that is new to say. Listen, then, for a little and hear the "wheels" begin to turn and creak and then to hum, be the grist wheat or bran!

Even in authoritative discussions on internal secretions, such as those of Biedl, of Howell, and of Sajous, one can find contradictions in a large number of pairs, and the total result in many respects is like unto the total result of research regarding the action of the nervous system: we have a deep-seated desire and much scientific eagerness to know all about it, and a hope that we may some time really understand it at least, but at the present time its mode of action is far beyond understanding. The status of the hormones and koliones is very similar indeed. So if you think you can get any more satisfactory material as a satisfier of your scientific curiosity than that I shall be able to present to you, I wish you joy in trying. I shall eagerly await the new information.

#### **The Parathyroids.**

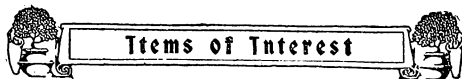
Dr. H. L. Smith, of Lynn, may have something more of much dental interest to tell you about the *thyroid gland* before long, but personally I cannot see as yet any *certain* relationship of undeniable value of the thyroid gland to practical dentistry. None the less, as Dr. Smith showed in his paper read before the Massachusetts Dental Society May 2-4, 1912, delayed dentition certainly appears sometimes promptly to yield to the administration of iodothylin. On the other hand, the parathyroids are certainly somewhat related to the study and practice of dentistry. The parathyroids were for many years confused with the thyroid gland. There are two pairs of parathyroid glands, one pair behind the upper end of the thyroid gland and the other pair behind the lower end. For many years they were undifferentiated from the thyroid, and frequently in experimental and surgical removal of the thyroid the operators also unwittingly removed the parathyroid. It is only at a comparatively recent date that the parathyroids came to be discerned as glands entirely different and in many respects opposed to the thyroid gland in their functions. They are small, rounded and thin; usually four in number, sometimes more, and consist

of a solid mass of epithelial cells which secrete a substance apparently not a "colloid," characteristic of the thyroid gland. When all the parathyroidal tissue is removed from the carnivorous animals (including man), the animal dies in from twenty-four to forty-eight hours. It has, however, recently been demonstrated (I forget by whom) that strictly herbivorous animals do not die from removal of the parathyroids. Physiologically, that is a very suggestive fact, and in itself most interesting, but it remains to be explained. The carnivorous animal dies in from twenty-four to forty-eight hours with symptoms of extreme irritation of the nervous system, convulsions, etc., which invariably end fatally.

In 1908, Macallum and Voegthlin showed that the injection of calcium salts counteracts the fatal action of removal of the parathyroids, and that the animal could thus be restored to apparent health, as far, at least, as these particular symptoms were concerned. Calcium salts, then, seem to prevent the toxic action of the removal of the parathyroids, which, therefore, apparently have something to do with the metabolism of lime in one way or another. Bones and teeth may obviously be concerned, but if so we do not know just how. This is all, then, that I have to say about any possible relationship of the parathyroids to dentistry: apparently they are in some way concerned with the metabolism of lime, and the teeth, of course, contain an unusually large proportion of lime.

We will now consider briefly the *adrenals*, or **The Adrenals** what were probably more often called when many of you were students the "suprarenal capsules" (a misnomer, because the adrenals in many animals are not "on top of the kidneys," as the name "suprarenal" implies; they apparently have nothing to do with the kidneys). The secretion of the adrenals is adrenalin, or epinephrin, or suprarenin; if you pay your money for it, you may take your choice of names. If you want to be really formal, however, use the term epinephrin; although the term adrenalin is that commonly used abroad, and adremin is best of all.

The injection into the circulation of adrenalin brings about the contraction of smooth muscle fibers, and thus vasoconstriction, wherever it may be, so long as the smooth muscle contains sympathetic nerve fibers in it. There are apparently two functional sets of hormones (the chief chemical materials in the internal secretions) which act on smooth muscle under different conditions, as L. F. Barker, of Johns Hopkins, has recently set forth. For example, pilocarpin acts only on smooth muscle containing *autonomic* nerve-fibers, while adrenalin, on the other hand, acts only on smooth muscle containing *sympathetic* fibers. The smooth muscle fibers in the arteries contain only sympathetic nerve-fibers, so that adrenalin, as all of you know well, is now commonly used to bring



about vasoconstriction for the purpose of checking hemorrhage. The difficulty about explaining the function of adrenalin, as that of the other hormones, in detail is largely due to the fact that it appears to work in conjunction with other internal secretions. In the metabolism of carbohydrates, for example, the adrenals seem to act with the thyroid, the pancreas, and the hypophysis, but just how, we do not know; we hope to know soon.

Unless I am in error, one of the "deepest" of the "spots" of dental interest in the hormones is close to the hypophysis cerebri (the pituitary body, "at the base of the brain") and its relation to this very matter of *carbohydrate metabolism*, to which this is an introduction. Let me first then give a brief historical sketch by way of mental orientation.

#### **The Pituitary Body.**

Vesalius and Galen supposed that the brain mucus was ejected through the pituitary body; that the brain secreted mucus which was excreted through the pituitary. (The word "pituitary," in fact, comes from the Latin "Pituita," meaning mucus; "hypophysis" means an undergrowth). Later on Sylvius and Vieussens thought that the cerebro-spinal fluid was secreted by the pituitary (a good guess, according to recent research by Cushing and Goetsch). Brown-Sequard formulated the doctrine of internal secretions, and Rogowitsch showed a reciprocity between the thyroid and the pituitary. In 1886, Marie demonstrated a relation between giantism and acromegaly and pathological conditions of the hypophysis, demonstrating that disease of this organ is one at least of the underlying conditions of giantism.

In considering the pituitary we are in a sense always discussing two organs rather than one. Histologically (as Professor Bates has doubtless explained) the body is double; on the other hand, physiologically, it seems to be triple. Anatomically, it is a body about  $21 \times 14 \times 5$  mm. in size, weighing usually from 56 to 60 c.gms. in men and in nulliparaous women. In women it increases in weight with each pregnancy, 106 c.gms. being an average in women who have borne children, with a noted maximum of 165 c.gms., according to Erdheim and Stumme. The anterior lobe is a hard, bean-shaped mass, somewhat concave behind, and is the true pituitary gland, according to Biedl, as it alone contains true epithelial or gland tissue; it is developed from the ectoderm of the mouth. The posterior lobe is smaller, rounded and soft, and is placed in the concavity of the anterior lobe. This posterior lobe is developed in the embryo from the brain tissue, and all through life is attached thereto by the infundibulum, a prolongation of the tuber cinereum. It contains little or no brain substance, but has connective tissue and neu-

roglia cells, which together constitute a stroma unusually loose in texture. Most of the mass of the posterior lobe, according to histologists, is of the nature of neuroglia, which is one of the greatest mysteries at the present time of the whole profoundly mysterious nervous system. It is composed of spider-shaped cells, which some used to think were a sort of packing cells (a kind of excelsior!) for the nerve cells; nowadays they are inclined to think that the neuroglia cells are of a truly nervous nature, but how or why or wherefore is all inconceivable. It is not as yet at all certain, however, by any means, that these cells of neuroglia are truly *neural* cells, despite Ramon y Cajal's skilled opinion. The inner or nervous part of the posterior lobe is partly invested by a tongue-shaped extension backwards, called the *pars intermedia*. It is this latter part of the posterior lobe which supplies the internal secretion (from its epithelial cells), as was described by Herring in 1908. These gland cells (of the *pars intermedia*) invade the rounded mass of the *pars nervosa*, and their product (puitrin or hypophysin) very likely is *actuated* in the nervous lobe, whence it passes on down into the ventricles of the brain and spinal cord. (This supposition was shown to be likely by Cushing and Goetsch, and corroborated by Howell.)

The secretion of the anterior lobe is concerned with the metabolism of bones and of the structural tissues generally, but at present we really have not any idea how. Inasmuch, however, as removal of the entire anterior lobe always causes death in a single day, it obviously has some other and more essential function which is as yet unsuspected.

If we were to summarize briefly the physiological actions of the posterior lobe of the hypophysis, we might suggest them under five heads:

- 1, Marked increase of the blood-pressure (same action as adrenalin);
- 2, Slowing of the heart (also same action as adrenalin has);
- 3, Dilatation of renal blood vessels and an increased secretion of urine (Shäfer & Herring);
- 4, Galactagogue (stimulation of the secretion of milk, and it is sometimes used for that purpose);
- 5, Decreased tolerance of sugar, sometimes producing glycosuria (Howell).

We are chiefly interested in the fifth of these apparent functions of hypophysin, the decrease of the tolerance of sugar, and sometimes causing the passing of sugar into the urine. This last function is certainly part of a syndrome, which includes the pancreas, the thyroid, and the adrenals. The internal secretion of the posterior lobe, then, is actuated by the complex apparatus of this lobe and is later on probably absorbed from the cerebrospinal fluid into the circulation. Thus much we have reason to believe scientifically is probable. Some writers, however, are not content to stop here.



## Items of Interest

### **Kirk's Guess Crititized.**

Editor E. C. Kirk, of Philadelphia, for example, with all the argumentative skill so conspicuous in editors at times, in a paper before the Toronto Dental Society, November 29, 1913, went quite a way further in hypothesis. This, printed in his "own" magazine, the January, 1914, *Cosmos*, attempts to make printers' ink and hypothesis temporarily take the place of experimental proof. He suggests that dental caries is due indirectly to irritation of the pituitary or hypophysis. Let us run through this hypothetical chain of Kirk's, and remember as we run that a chain is as strong only as its weakest link. I think, however, that there are at least three weak links in this particular gilded chain, and that is one reason why I think it interesting, if not necessary, to take it up and examine it a bit.

Dr. Kirk's first hypothesis is the presence in the normal saliva of a carbohydrate in those people who are especially susceptible to caries.

We all know, of course, that some people seem entirely unsusceptible to dental decay, and so have splendid teeth, and that there are others who more or less continually suffer even from early childhood with a large share of caries. This first hypothesis that he makes (the frequent presence in saliva of a carbohydrate in susceptibles) he had not yet paused to demonstrate. He says its determination (its truth or its falsity) is a matter of fact. Why, then, does he not prove or disprove it? Abderhalden, the productive biochemist, has demonstrated for the first time recently the presence of amino-acids in the blood; he accomplished this important fact only by using many liters of blood, much more than had ever been employed before for this purpose. The same method might show the absence or presence of carbohydrate in the saliva of caries-susceptible people; and plenty of people could be found to furnish saliva in any quantity among the many thousand idle people in Philadelphia. His argument is based on the further hypothesis that if there is excess of sugar in the urine (glycosuria), you would also "get" it in the saliva; that in itself is a gratuitous presumption not very satisfying to a physiologist. So far as I know, at least, sugar never goes into the saliva under normal conditions. The salivary glands and kidneys are very different in structure and in function; there is especially a vast difference in their respective falls in blood pressure, and there is no pressure difference in the salivary glands similar to that in the renal vessels. The work quoted above (by Cushing, Goetsch, and Jacobson) on the relations between pituitrin and glycemia has no word in it of relation between glycemia and the saliva.

Another hypothesis: The tendency to dental caries which is seen sometimes in pregnancy is due to some irritation of the pituitary. It is



perfectly proper that Doctor Kirk should make such a remark, but what about other causal conditions? We are all aware that women when pregnant are rather more apt to suffer from dental caries than at other times, but there are other conditions that might bring it about. For example, a general katabolic strain (which brings about the appearance of cysts, neoplasms, etc., of many kinds). Or, a disturbance of bone metabolism by a possible action of the *anterior* lobe of the pituitary would be just as good a supposition. Or, the general hyperesthesia of the nervous system during pregnancy might be said to make carious teeth more conspicuous to the patient, thereby bringing her to the dentist's chair more often. The thyroid is well known to be very closely related to the entire generative mechanism, and these varied conditions are much more apt to be due to the thyroid than to a supposed irritation of the pituitary.

Another hypothesis: Stress of dentition irritates the posterior lobe of the pituitary. From Doctor Kirk's discussion of this point one gets the impression that we all pretty much spend our lives, at least up to the eruption of the third molars, with our nervous system literally undermined by dental strain! My experience does not tend to corroborate such a supposition. But as a matter of physiology, the nerve paths of such disturbing influence are not at all obvious and remain to be pointed out. Can Kirk demonstrate any pathway by which dentition would regularly irritate the pituitary's posterior lobe? And what is "stress of dentition," anyhow, however convenient to the theorizer?

Thus a hypothetical "strain" hypothetically is hypothesized by Kirk to irritate the posterior lobe of the hypophysis, which causes a hypothetical glycemia and this a hypothetical glycoptyalism which produces a hypothetical fermentation from which lactic acid by way of bacteria causes caries (without, perhaps, either hypothesis or hypophysis).

None the less, the series of suppositions *may* be true, however unscientifically hypothetical before demonstration. Kirk, indeed, speaks of his paper as a protocol of a research he is now organizing in "the hope of experimentally determining the truth or error of the doctrine set forth." He takes the great editorial privilege of publishing (and as a "leader") a long and concatenated guess; none the less, it may prove years hence to be a good guess, for things reasonably might possibly work that way. Meanwhile we will keep the tooth-brush in the bathroom or the dressing-room within easy reach, and our cortical neurones groping—for *facts*. We will not, moreover, in our teaching, whether of students or of patients, cross this hypophyseal bridge until we are sure it is there.



**Second District Dental Society of the State of New York.  
February Meeting.**

A regular meeting of the Second District Dental Society of the State of New York was held at the King's County Medical Library Building, 1313 Bedford Ave., Brooklyn, N. Y., on Monday evening, February 9, 1914.

The President, Dr. Lewis, occupied the chair, and called the meeting to order.

The minutes of the last meeting were read by the Secretary, and duly approved.

The subject this evening is one of especial interest to the members of the Second District Dental Society. For a great number of years, the members of this society have been interested in the mouth hygiene movement. I believe that the old Brooklyn Dental Society, which was the parent of the Second District Society—the oldest society in this Borough—was one of the first dental societies, if not the first in the country, to start a movement along this line. It may be a piece of history to some of you to know, that back in 1871 the Brooklyn Dental Society equipped and ran a free Dental Infirmary in this Borough at the corner of Washington and Fulton Sts., I believe. This, like many later efforts, was discontinued after a while.

Then among our members for a number of years we have had one of the fathers of mouth hygiene, Dr. Hyatt, who talked mouth hygiene, and the education of the public and such like things, early and late and



was laughed at all over the State. Dr. Hyatt is still talking, but he is not laughed at to-day!

Coming down to later times, the Second District Dental Society founded and partially equipped a clinic in the Friendly House, on Warren St., Brooklyn, which was carried on successfully for several years. Then we interested the Brooklyn Bureau of Charities in the work and a Dental Infirmary was opened on Livingston St., and about twenty-five or thirty of our members gave their time and services free for several years.

Finally, through the instrumentality of this clinic, the Board of Health became interested in the work which was being done, and the Bureau of Charities finally turned the equipment of this Infirmary over to the Board of Health. The Board of Health is now running it under the Department of Child Hygiene, and supplying the operators who do the work there. This was the first of the Municipal Clinics to be founded, and there are now several in this city in the different boroughs.

To-night we are to hear a report, but whether that report will be favorable or unfavorable to the work I do not know; but we are all interested to see what that report will be, for great numbers of dentists have felt that the mouth plays a great and important part—especially the mouths of children—and this experiment was really not philanthropic in its motive at all, but merely to see if we could deduce some scientific data to either prove or disprove the theory that the proper care of the teeth must add greatly to the general health of the school child.

(Dr. Holbrook here read the Report of the Committee on the Improvement of the Teeth of School Children, published in this issue.)

**President Lewis.** Dr. R. F. Willis, Brooklyn Borough Chief, Department of Child Hygiene, Department of Health, will tell us what the medical inspectors found before and after the test.

**Dr. Willis.** I wish to congratulate the committee upon their splendid work and to say that their results have been a great surprise to me. I have been glad to co-operate with them and to present what the inspectors of my department have found in these cases.

Cases complete and health records available . . . 79 cases. Of these there were 41 cases of malnutrition, of which 17 were cured, 22 improved and 2 showed no improvement; 2 cases of defective hearing, both improved; also 2 cases of hypertrofied tonsils, which were improved.

As far as we could ascertain none of these cases received medical treatment during the period stated in the reports, which makes the results most startling.



## Items of Interest

We will now hear from Dr. A. H. Stevenson,  
**President Lewis.** Chairman of our Committee on Public Health and Education, who will tell us what the committee have done in some cases.

**Dr. Stevenson.** To the lay mind statistics do not mean a great deal. I will take a few cases from among these children that may be coincidences, but nevertheless do show improvement in their respective classes. I think both Dr. Willis and Dr. Crampton in their respective departments would uphold me in saying that the biggest difficulty always encountered in conducting a test of this kind in selecting a number of children for even a limited period is to control those children—to keep in touch with them. We have endeavored to do that. How we have succeeded you can see by the comparatively small number we have left from the number originally selected. We have but 82 cases. We had 327. I guess there are a great many members of our society present here to-night who have sad stories to tell of tolerating broken appointments that they would not tolerate from their own patients. To those men I want to say that credit is due them just the same as to those whose children have finally been carried through the final test.

We had 82 children, but I am not going to give you the records of 82 individual cases; just a few typical ones.

Case, I. K. Child was reported to have defective nasal breathing and malnutrition. Dentist reports gums in very bad condition. Five fillings inserted; all but four sixth-year molars broken down to the gum line. All roots of the four molars were filled, one twelfth-year molars partially restored—was gone practically; the entire masticatory apparatus of that child was restored by the dentist.

There was an increase in general school average; child's record for three terms being sixty-five per cent., the term while under treatment, seventy-five per cent. Past six months, ending February 1st, deportment remained the same. Health report: defective nasal breathing improved, malnutrition improved, and the child gained eleven pounds during that year. It may have been a coincidence, but I leave that for your own judgment.

Next case, H. P. A child whose deportment as reported by the principal was such that they made a special comment each time we requested a record; said the child was exceptionally troublesome. We asked for no such information; we simply asked for the child's percentage, but the principal took it upon himself to present this child as troublesome. This child was also reported as having practically all of the molars restored; eleven fillings, four extractions of temporary roots



that were abscessed. Child's days absent from school, time  $65\frac{1}{2}$  days; during the treatment,  $7\frac{1}{2}$  days; during the past term, one day absent. General average in studies, same. Deportment increased to seventy-five per cent. Malnutrition improved; slight gain in weight and height.

You have noted probably the two cases that Dr. Willis spoke of, with defective hearing; both these cases were improved. I could go on in this fashion with a number of cases that I have selected and show you the increase, but I am going to show you something of the negative end. There is one case of a boy who was kind enough to come here to-night, and I am going to have him stand here and I will show you the case of a child who has improved a great deal, but the improvement has been due to himself.

How very easy it is to make false statistics or draw false conclusions. Samuel Shagan's case has consistently improved. He has gained forty-two pounds in a year and a half. If we attempted to base our statistics on weight, this one case would so inflate our general average as to make it useless. Eliminating the weight problem entirely, he has consistently improved in his school attendance, his general average in deportment, has been a good disciple of mouth hygiene, and is very comfortable.

You see of what little values the findings would be if averages were made of selected cases and not the whole. I have here 30 cases back from the 82, but if I isolated those the percentage would have been enormous, and look very fine in print and argument. But the committee has simply taken the records from the principals of the schools, and we have also taken the records of the Department of Health.

I have other children here. These children are very proud to come and stand up here and show you what they have done. They have taken hold of this test conscientiously, have realized what this work has meant to them, and have carried out the instructions given them. For very obvious reasons, I am not going into the records of all these children.

Cannot all cases of marked improvement have consistently been cases where the greatest amount of work has been done in the mouth? Where mouth lesions have been cleared up in the greatest number there has been the greatest increase in the average of studies and their health records. Is this a coincidence? We have the sheet here, the record as the examiner in the school made it, showing number of cavities in the child's mouth; accompanying that, the record made by the dentist at the conclusion of the work, showing just what he has done, every dental operation he has performed in that mouth; below, the comments of the dentist on that child. On the other side we have ruled off spaces show-



ing for the term prior to the test, during the test, and since the test, number of days absent, general average and deportment. Below, the health record before the test and after the test.

All records we have are from the principals and medical inspectors. The report perhaps has not come up to the expectations of a great many men who looked for sensational statistics. It may not have come up to the records of other tests made throughout the country, but the big thing we must remember, after all, is that these children were not isolated from the others, not put in special classes, with special teachers, examined by special physicians and given special tests. We could be more scientific undoubtedly a year after the termination of the dental treatment than we can six months after.

This treatment only ended ten days ago, and all these statistics have been gathered since then. In another term there will undoubtedly be more marked improvements.

I am reminded now of a bit of Chinese philosophy, that if you want something to last ten years, go plant a tree; if you want something to last 1,000 years, plant a habit in a child. We have started these children off right. We have shown them as near as we could the ideal; we have given these children the proper instruction. Let us hope all who see the test will be charitable to our inefficiency, and will remember that we do it all with the conviction that we present what we firmly believe to be the correction of the greatest and most common defect known in the school child to-day.

**Dr. C. Ward  
Crampton, Director  
of Physical Training,  
Board of Education.**

My relation to this work is rather one of an observer, and I am here to-night merely to find out what the results of this work have been. I believe that this is one of the most significant things that has been done in New York City for the health of public school children for some years. It involves the co-operation of the Department of Education and the Department of Health, but it was begun and put through by a professional organization that demonstrated its professional worth and its social value by conceiving a thing of this sort, and then bending every energy to its successful completion. I beg to congratulate the society upon the work of its members, and I believe that the results of this work will be important.

It is true that we have lacked definite scientific data upon the improvement of children, resulting from improvement in their teeth. This series of data I believe you have supplied. While the figures are modestly stated as being meagre, yet they are definite, and with control will be recognized as of undoubted significance. Exactly what this will lead

to I do not know. It certainly will lead to more definite care of children's teeth, and a more expansive care of children's teeth.

**Condition of  
Teeth of  
School Children.**

For many years I have been aware of the sad condition existing in the mouths of the children of the City of New York, and have published the results of my investigation from time to time in annual reports. I have found, as you have, in children thirteen and fourteen years of age, an almost total absence of the sixth year molar. I have found scarcely three per cent. of children entering high school with their mouths without blame of some kind, and a very appreciable proportion of such children with mouths that one hardly cares to look into twice; but I was not prepared to find in the six and seven year old children in the entering year of the elementary school, right from the kindergarten, street, or homes, that the sixth year molar in thirty per cent. have broken down—a molar that had not been in the mouth for perhaps an average of a year. This was a great astonishment to me, and I think it merely points in the direction of the necessity for public notice of this important work that you are doing—correlative work.

I am indebted to members of your society for a very deep interest in dental prophylaxis, and I am in hopes that the Department of Education may take some very decided and very expansive steps in that direction. I confess, Mr. President, and gentlemen, to a feeling of stimulation and support that you are giving to the health work of the City of New York, and I am very much impressed with the quality of your scientific results and the quality of the social instinct that has prompted it.

**President Lewis.**

Superintendent Maxwell of the Board of Education has been very much interested in this test, and I have here a letter from him to Dr. Stevenson, Chairman of the Committee on Dental Health and Education.

(Read letter from Supt. Maxwell thanking the society for invitation, and regretting that he is unable to be present.)

We have with us Dr. John H. Walsh, Associate Superintendent of Instruction of the Board of Education, and we will now ask him to say a few words.

**Dr. Walsh.**

Some members of an association were once gathered together at the death of a fellow member. They sat quiet for a long time; no one seemed to have the hardihood to say a good word for the dead man. Finally a lady who was in the audience asked if she might, under the circum-



stances, as there were no remarks being made, take the time for a while to discuss the subject of Womans' Suffrage! (Laughter.)

What I would like to discuss, not knowing anything about dentistry, is truancy from the schools. That is the job I have now. I notice I was down on the programme for discussion, but it is not fair to oppose something that has nothing in it to oppose. The only fault I can find is that you delayed so long in starting it.

### **Causes of Truancy.**

As to the matter of truancy, my attention was first called to three of my own boys, years ago as a principal. I had clubbed them—the rules were not the same then as now. According to one of the Commissioners, the higher branches then were maple, oak, birch and hemlock. One day at one o'clock I saw these three brothers going by, and I said to the policeman: "That's rather brazen; they seem to have no idea of coming in." The policeman told me the mother of these three boys was a drunkard. That meant they had nothing to eat. They were going to an uncle's at a distance, and, of course, could not get back to school that afternoon.

I was interested in another case where a boy was very troublesome along through the grades. He got into the class of a woman friend of mine, and I asked her how this boy behaved. In the other classes, he threw things across the room, kicked his neighbor, and behaved very badly indeed. She found out the trouble was he came to school every morning without his breakfast. Well, after that she brought a double lunch, and his behavior was much improved.

Later on, when I was put in charge of the truancy matters, I tried to find out what was at the bottom of this condition. In my opinion the truant is the only one worth while; he is a fellow of energy; but there is another type of truant, and I wanted to see what was the trouble with him. He is the retarded boy, kept back sometimes; it is too hard. He says nothing; he is seated in the rear of the room, does not seem to hear or pay attention, and he gets a reputation for stupidity that he does not deserve. It may be the teeth are to blame for this.

Take a fellow with a bad mouth; why would he not wander off to the park or somewhere to get away from that ancient lady behind the desk?

I believe that you people have a wonderful influence on the school system in that way, by removing some of these removable causes—some of the things that keep a boy back. The town will save a whole lot of money if the children are pushed forward as rapidly as they can go.

I am glad to see the child coming into his own. The old fashion was to pound the child. We should find out what is responsible for truancy.



It may be the teeth, it may be the hearing; it may be improper food at home, and we are on the way to learn these things.

For years I have been wondering at the output of stuff from Washington about diseases of the pig, of food for the cow and such things—volume after volume. Very little was said about the child, until recently. Now you are doing a wonderful work, but you are slow, and that is the fault of our big towns. We have all the conceit of size. 'Way out in Oklahoma or somewhere else they can start this movement, and money is furnished. If we want to do anything here, it has to be done by private enterprise, and after you open our eyes then we rush in and want to claim all the credit.

**Care of Children's  
Teeth in the  
United States.**

I cut out of the paper the other day some interesting data about this work in other towns. Mobile, Ala., has dental inspections done by dentists. Eighty-seven per cent. of the school children in New Orleans have defective teeth, and so on.

They have a dental inspection staff organized there. The Detroit, Mich., School Board passed resolutions making proper care of teeth a factor of promotion in schools.

It is horribly unfair to professional men that give their time, to have that time wasted on that dental clinic when they take hold of it. Detroit spends about \$7,000 a year for dental inspections; we spend nothing. Tulsa, Okla., has local dentists who will make the examinations. It does not say they will do it without pay, but I guess they will, as I note the school board gave favorable action. Children whose teeth need attention in Saginaw, Mich., can go to a dental clinic conducted by dentists. It omits to say at their expense, but it is more than likely. Hammond, Ind., also has dental inspection. It is a shame that our large city has not done something definite, and all I can say is God-speed, and I hope that they will rapidly make it possible for this thing to be done properly and without extraordinary expenditure of their time.

Several years ago the statement was publicly made that no one thing could be done to raise the standard of public health higher than attention to mouth hygiene. At that time I think the statement was received with a good deal of suspicion, but if we needed any proof of that statement, we have it in the report we have listened to to-night. I think this society is to be congratulated on the splendid work it has done. Few of us realize anything like the amount of work which has been involved in the bringing about of this report which it has been our privilege to listen to.



I do not know anywhere in the country of a work carried on so carefully and under such control as the work which has been done by the committee in this city.

I believe that the statement which I made as I began my talk is true. I really believe there is not one thing which can be done which would so raise the standard of national health as attention to mouth hygiene, especially in regard to the teeth. I think not even the most enthusiastic dentists, like Dr. Hyatt, for instance, have any idea of it. If the proper attention could be given to the mouths of the children in the public schools the general health of those children would be greatly improved.

Seven years ago, in Manhattan, there was opened in the school at 552 West 53d St. the first dental clinic in the United States. This was carried on through this society, dentists giving their services free, the society paying for the materials used and equipment. Dental treatment was made compulsory upon every child in the school.

Clinics have been started in the Five Points Industrial School, in Chambers Street School, in the Colored School in 53d St., and in the Sullivan Street School among the Italians. If the principals were here to tell you of the improvement in better attendance, work and deportment of these children, you would hardly be able to credit it. The results have not been carried on scientifically, but solely in the interest of the children—children who are in most cases unable to go to the public schools because of the poverty of their homes. The results have been startling.

I think no one, least of all the dentist, is willing to believe that all the ills flesh is heir to come from the teeth. I do think in the light of the work recently done in bacteriology by Rosenow, and those associated with him, we cannot lay too much emphasis upon the care of the human mouth and the relation that the mouth bears to the general health and well being.

Not the least has been the educational value to the children. Into all these homes there has been brought for the first time a realization of what dentistry may mean.

I well remember the small child who came to my office a year ago, evidently looking for a monster behind the door, and with her teeth in a terrible condition. I wondered whether I should ever be able to do anything in that mouth, and yet that child has never failed to keep an appointment, rain or shine. I do not know whether it rained in Brooklyn last Saturday or not, but it did in New York, in torrents, and that child kept her appointment in spite of rain, and was one of the children here

to-night, and the mother came with her on each of the visits, and there has been no greater appreciation than that of that mother and that little child.

As to the report you have listened to, I have nothing to say more than that I believe it will mark an epoch in the work which is being done by the dental profession in the United States in the interest of mouth hygiene.

I said this evening that one of our members was  
**President Lewis.** one of the pioneers in the mouth hygiene campaign, and has been talking on the subject for a number of years, and is still talking. As he is still talking, we are going to ask him to continue the discussion of this paper. Dr. Thaddeus P. Hyatt.

The only thing I should like to say to-night is  
**Dr. Hyatt.** to ask, what will be the next step? I do not think I need to say anything in regard to what has been done. I think the report has been most favorable in that it has been so conservative. I believe with Dr. Stevenson, that if the committee had reported to us this evening wonderful improvement, children from twenty per cent. in study jumping to one hundred per cent.—that children had not stayed away at all, that blindness had been cured and cripples walked, we might have had a great deal of doubt about it.

The report that has been made to-night is one that we should feel greatly encouraged by. We have all known that it is very hard to control children as they are in the schools to-day, but that is not to my mind the most agreeable and the most important part for us as members of the dental profession to look at. To me the most important part is the fact that we have with us three persons who are not members of the dental profession, two physicians and an educator. You have heard what they said. We had one rebuke, that we ought to have done it before.

My friends, you have no idea how hard it has been to start it now. It has not only been the bashfulness—I cannot say of the members of the dental profession—but timidity in taking up work that we questioned being able to prove the value of. There has been a timidity by a great many of the members of the society. I think that ought to be removed to-night, and to me the one interesting question left now is what are we to do next?

I believe men are realizing the importance of reflex nerve action—how the irritation caused by the nerve in a decayed tooth is reflected back, and comes out in some other part of the body—how it affects the mentality, and the other senses, coupled with malnutrition. That is bound to come logically as well as scientifically, because the mouth is the portal of all the food and liquid and air that the child takes in.



## Items of Interest

I think if we can to-night appoint a committee, and have these three gentlemen on the platform, who are not dentists and not members of our society on that committee with us, and then try to interest every man who has any friends that are in touch with or can introduce him to the officials of this municipality, I believe we can go to the Mayor, and to the Board of Estimate, and show them where the city will save money by spending a certain amount in taking care of the children's mouths. I hope that some action along that line will be the outcome and this meeting will, to a great extent, have failed if it does not become the birth-day of a new movement.

We have proved conclusively to these two physicians and to Dr. Walsh the improvement that has come to the children; and if we can gain their co-operation and that of any other of the educators in our public schools, and then go to the Mayor, I believe that this meeting will have been a great success. I sincerely hope that that timidity has disappeared from among our members, and that the friends will all co-operate with us, and that such a thing can be started at once.

**Dr. Lewis.** Ladies and Gentlemen, this subject is now open for general discussion, and we would be pleased to hear from any person who may wish to address us.

**Dr. Hyatt.** Mr. President, I should like to add that the member who first suggested this idea, and who has done so much for it, is present, and I think he should be invited to speak.

**Dr. Lewis.** Dr. Ottolengui, we would like to hear from you on the subject.

**Dr. Ottolengui.** I feel particularly honored to think that a suggestion that I made before this society has been carried out, especially as "carried out" in this case means that so much work has been done by so many men; but would it not be time wasted and a sin, if we did not make a logical deduction from this work, which I think has not been made?

Dr. Hyatt truly asks: "What next?" He said he was encouraged by the report. I think he ought to have been awfully discouraged by it. There is a point that I want the gentlemen on the platform to note particularly. This test, if it has proven anything, has proven the absolute impossibility of curing or stemming the tide of caries in the public schools by the filling of teeth. We had a chance to take care of over three hundred children, yet only one hundred and sixty children accepted our care, and with a year's work by sixty-three men we succeeded in completing the filling of the teeth of only eighty-two children; and there are



## Society Discussions

six hundred and eighty-five thousand children in the public schools in New York, all in the same condition.

### Prevention Better than Cure.

It proves that this disease must be prevented, and not cured after it occurs; and the way to eradicate it is not to take hold of the entire school system of the country, when we have not dentists enough to fill the already decayed teeth that exist in the mouths of these children. We should take the child that comes into the school at the beginning of his career, and safeguard him from that time through, so that at least the possibility of caries in his mouth shall be minimized. I must say that I have been very much discouraged to hear to-night from Dr. Crampton that in the very lowest classes thirty per cent. of the sixth year molars are already diseased. That makes the work before the prophylactician much greater than I had thought. I had harbored the hope that with skilled prophylactic work in the schools, starting in the lowest grades, caries might be very much minimized.

I want to say just a few words about this test. We went into this matter honestly. I think a good many of us felt that with the test that had been made in Cleveland, where the children were under absolute control, and where a great many things besides dentistry were done, including special food and training, so many claims were made that the educators and the physicians of the country were not very much impressed.

The effort here was to see what just average dentistry would do for children—to see what would occur if the children just went to the nearest dentist. And we have found that *very few would go even if they could go free.*

I do not see any of the children that I treated up on the front row. I want to show you that although this test was suggested with the idea of proving to the Board of Health and Board of Education that children would do better with sound teeth than with unsound teeth, and notwithstanding the fact that accidentally I got three children instead of two to take care of last winter, my very first examination of these children satisfied me that there was little possibility of my increasing their mental, moral or physical records so that they would show a high percentage of improvement.

In the first place of these three children, two had malocclusion. No amount of filling of the teeth of those children would give them efficient masticatory apparatus. One had a very pronounced Class III condition. Gentlemen, filling that boy's four molars could not give him a good masticatory apparatus. There was no chance for me to make any show-



ing on his school records. He also had a very low mentality; he had a mental endowment that I do not believe could be stimulated simply by filling four holes in four teeth, but I do believe that he was improved in another way that I will mention in a moment.

Now in the second child sent to me, a girl, I found it necessary to fill two small cavities in upper molars, and remove the pulps in two lower molars. I have no doubt I made her more comfortable, but that was all I could do. She was as bright as a button; on the minute for every appointment. She was an Italian, and knew she was getting her money's worth.

The other little girl I had was a very nice little lady, and she had the hardest time of all. She only had the treatment necessary to four molars. I had to fill two upper molars, and remove the pulp from two lower molars.

Of these two girls, one very bright, one just medium, and the boy dull, only twelve fillings were put in; and beyond making these children comfortable, that particular work could not have had very much effect upon their school standing or records, except as it stopped toothache for one girl, and I see by the records that that girl made the best school improvement.

None of these children were cleanly in mouth habit, and it seemed to me that my associate, Dr. Kinney, could do a great deal more than I for these children by giving them regular drills in prophylactic work. These children were regularly drilled in the methods of cleansing their teeth, and I do think we succeeded in making one of them learn how to clean the teeth thoroughly and to keep them clean; but curiously enough, the brightest girl was not the one that learned to keep her teeth the cleanest. Yet it was the girl who did learn who showed the best improvement. Therefore it seems to me that it was not so much in the curative work, but in the prophylactic work done in my office by Dr. Kinney, that the highest good was accomplished.

The real interest in these figures lies in the fact that any improvement could have been made in these children practically, not since their teeth were finished, but during the progress of the work because these records were made whilst this work was going on. It has been said here to-night if the record for the next term can be taken after all of the work was done, and especially if those mouths could be kept clean, we would have even a better showing. What does that mean? That means they must not be allowed to decay at all. It means the sum total of a tremendous amount of manhood and womanhood saved to this city, if we preserve the health of the children, and the last suggestion I would

make is, as we have before us the men who are powers in the municipality in health and educational matters, can we not have the co-operation of the Board of Education and the Board of Health, and of this society in one more test?

I would like to see children selected in whose mouths there is a tremendous amount of dental work needed; not two or three cavities for each. I would like them chosen where they have absolute septic conditions. I would like them to have teeth not in malocclusion, but sent to us solely on account of the dental work needed. If coupled with that, these children have a health record which shows that they are suffering with that kind of disturbance which we, as dentists, claim arises from this condition in the mouth; and if along with that they are low in their grades and studies, and if these specific medical records and these specific school records be taken, and then these particular children be put into our hands, I believe that I can guarantee that we will improve every one of these children in health and education at least fifty per cent.

Dr. Ottolengui stated that it did not make very much difference about two or three cavities. Two or three cavities can contain bacteria. If they have done nothing else then, they have changed these children's mouth conditions.

Of course, there are many that have malocclusion, and malocclusion takes a great deal of time to treat. I do not say he could give them back their proper occluding surface, but he could give them back a clean, healthy mouth, so that the food that passes through there would not go into their systems in a tainted condition, and then, at least, we could help the health of that child.

The constant pouring of pus into the system, as Dr. Hartzell and many other men state, reduces the immunity of that child, and I say, if we cannot do anything else, we can teach those children to keep those teeth clean.

Before we adjourn, I should like to move a vote of thanks to that Committee. I know they had a great deal to contend with, and I think that Committee ought to receive a very sincere vote of thanks from this society. and I would also like to include a vote of thanks to the members of the Board of Health and Board of Education that have so ably co-operated with them. (Unanimously carried.)

Dr. Hyatt.

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## **Influence of Dental Attention upon the Mental and Physical Condition of Children.**

The dental profession having been aroused to the dental needs of children, especially of children in the public schools whose parents may not be financially able to supply their progeny with such care, the dentists of this country have energetically set about finding a solution of this huge problem.

In order first of all to prove the need, dentists began making inspections of the teeth of children in the public schools. Such inspections at first were resented as being useless, besides interfering with school routine. A few persistent dentists, however, soon unearthed such dreadful conditions that very soon the right to inspect was granted whenever request was made. The reports from all parts of the country have been so similar that it is safe to assert that caries is a disease very prevalent in young mouths, and that a very conservative estimate states that seventy-five per cent. of all school children are thus afflicted.

Seeking for an alleviation of this scourge, it is not strange that the first remedy thought of should have been the Free Dental Clinic. "If children are suffering, shall we not treat them?" The answer seemed obvious, and free dental clinics began to appear. But though the dental world easily recognized the need, municipal officers were not so easily convinced. Hence the earlier clinics were equipped with money

### **The First Remedy Suggested**





## Editorial

furnished by dentists and the services were rendered by dentists free of charge. But very shortly it became apparent that not all the dentists in any town could fill all the teeth of school children needing attention. Consequently, dentists tired of giving so much of their time for such meager results. Hence, it became necessary to prove to School Boards, Boards of Health and City Fathers that the children's needs were great enough to warrant the expenditure of the city's money.

### **The Marion School Test.**

Then Dr. Ebersole, aided by other Cleveland dentists, undertook to prove practically the advantages of mouth hygiene and dental care. The so-called Marion School test was carried through and marvelous results reported. Indeed, these results as reported were so marvelous that the incredulous refused to believe. Yet there is no doubt that all the records were correctly tabulated and reported and that the children were benefited to the extent claimed. Nevertheless, this test was lacking in one great essential. It was impractical to apply it to our public school system. Such care as was given to these thirty children could not possibly be given to the seven hundred thousand children in the New York Schools, for example.

### **The Second District Society's Experiment.**

The Second District Dental School of the State of New York undertook to investigate this matter by another route, and the results of that experiment are published in this issue and should be read by all apostles of mouth hygiene, by all Health Boards and School Boards, and by all lovers of children.

The avowed aim was, if possible, to determine what advantages would accrue to retarded children by supplying dental service. Not special service; not special diet and lessons on mastication; not dentistry admixed with physical culture and what not; but just plain, everyday dental service, such as a child might get from the dentist nearest to his home.

The report, as has already been said, is most important, and should be carefully studied in detail, if one would arrive at the true meaning. But a few very significant facts may be selected upon which to found a discussion.



## Items of Interest

### **Conditions of the Test, and Results.**

First of all, the children were not to be grouped together and specially taught, exercised, fed and treated. Thus there was no element of personal pride aroused, and no co-operation of one child with others, through example or ambition, to excel its classmates. Nor did the dentists meet together, arranging methods of treatment and combining their efforts to the desired end. Each dentist agreed to receive into his private practice two school children and to care for these two as required for the term of one year.

It was clearly explained to the parents of the children that the dentists selected to do this work were competent men, and that there would be absolutely no charge made. These letters were sent to the parents of 327 children retarded in their studies and in need of dental care. Consents were received from 243, so that twenty-five per cent. of parents to whom this service was offered declined it, or at least did not accept. Whatever the reason, this alone would indicate that the mere offer of free dental service will not solve this great problem. But we are yet to see that not even the other seventy-five per cent. accepted.

In the first assignment of children, 164 children were assigned to eighty dentists, and at once trouble began. To quote the report, "The children failed to keep appointments. We had reckoned without the child. Some of these refused to appear for treatment because the dentist was too far. Others for the same reason that a great many perfectly normal and intelligent people give."

Of the original quota of 327 children greatly in need of attention, eighty-two were actually treated thoroughly, a still greater evidence of the futility of offering free dental service, except as a charity.

### **Results Obtained by Treatment.**

The results obtained with the eighty-two children treated are so entirely credible and yet so important in showing that simple, plain dentistry, honestly administered, is of real advantage to the child, that there can be no escaping the duty which now devolves upon the communities, for the child is the greatest asset in community life. That duty is this: *The child's teeth and mouth must be cared for, even though a clinic in every school be required, coupled with compulsory prophylaxis and dental attention.*



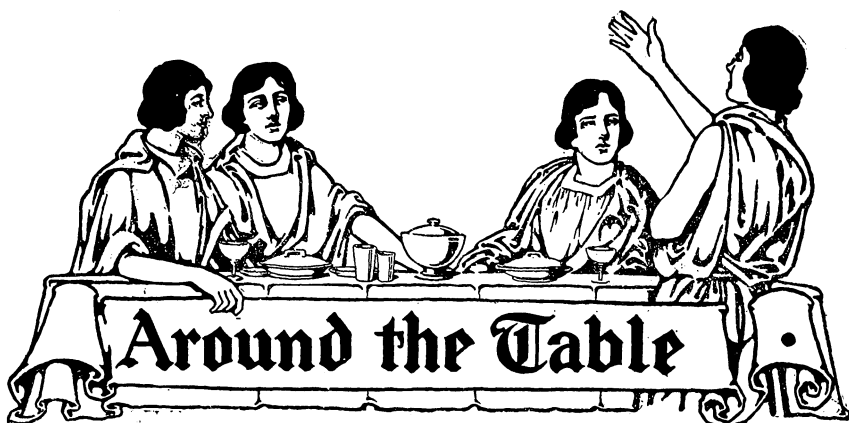
## Editorial

Of the eighty-two children actually treated, fifty-five per cent. improved in their studies, the average improvement per child being over ten per cent, and this average was actually higher because twenty-seven of the children retrograded, and the care of their teeth and mouths certainly could not have been connected with such retrogression, yet these delinquents were included in computing the average advancement per child. But while we may expect some improvement in aptitude at study through dental care, this would be but a collateral result. What dentists loudly declare is, that care of the teeth will improve the general health. It is gratifying, therefore, to find it stated in the report that of forty-two cases of malnutrition, twenty-two improved and seventeen were cured, a total of ninety-five per cent. cured or improved. Two cases of defective hearing are both reported as improved after dental care. To fully appreciate these statistics it must be remembered that the dentists knew nothing of the records of these children. The school records before and after treatment were taken by the School Board and the health records by members of the Board of Health.

It seems therefore fair to presume from this test and its results that plain, everyday dentistry, combined with prophylaxis, will improve the child's health record and study record. It also seems to indicate that the free dental clinic, as valuable as it is, will not greatly stem the tide of dental caries in the public school.

### **The Prophylaxis Clinic.**

Just at this psychological moment in the history of this mouth hygiene campaign, comes the graduation from the Fones School for Dental Hygienists of a class of thirty young women who will take up this work seriously. Of this number Dr. Fones has reserved a staff who will co-operate with him in establishing a purely prophylaxis clinic in one of the public schools of Bridgeport, that city, with commendable enterprise, having voted the money with which to carry on the experiment, an experiment which should arouse the keenest interest throughout the civilized world as the first scientific attempt to prevent caries in a wholesale effort.



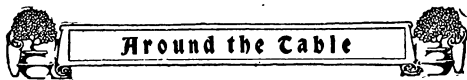
IT WAS RECORDED in our last issue that at Rochester I made a promise  
 ❖ to describe the use of sodium and potassium in the treatment of root  
 ❖ canals. I cannot do better perhaps than to report a conversation that  
 ❖ occurred in the Dutch Grill of the Hotel Powers. A gentleman from  
 ❖ Cleveland remarked: "I listened with much interest this morning to  
 ❖ Rhein's lantern talk on root canal treatment and filling. It was en-  
 ❖ lightening to see radiographs of roots improperly filled by the previous  
 ❖ dentist, and other radiographs of these same teeth cleaned out so that  
 ❖ wires in the canals were shown in the radiographs to be at or through  
 ❖ the apex. I am willing to admit that he has done this, because other-  
 ❖ wise he could not have the radiographs, but I do wish he had more fully  
 ❖ explained the technique. It does not enlighten me much to hear him  
 ❖ state that with sodium and potassium he succeeded in reaching the end."

□ □ □

"I AM GLAD YOU brought that up," said a man from Minneapolis. "I bought  
 ❖ a bottle of that stuff once, and used it in a root canal without any bene-  
 ❖ fit whatever, and I sealed it in three times at that. But at the fourth  
 ❖ sitting I could get no farther up the canal than at the first sitting. And  
 ❖ what was worse, by that time the whole bottle of the stuff was useless;  
 ❖ turned to a dry powder."

□ □ □

"SODIUM AND POTASium is not to be used in that manner," said I. "If  
 ❖ you wish I will describe the technique." Having obtained unanimous  
 ❖ consent, I continued. "Sodium and potassium was introduced to the  
 ❖ profession of this country at the World's Columbian Dental Congress  
 ❖ and in value is worth all the money spent on the congress. It was pre-  
 ❖ sented by Dr. Emil Schreier, of Vienna, and the best preparation is that  
 ❖ put up under his supervision, and imported. Another preparation put  
 ❖ up in this country is in small phials the object of which was to meet  
 ❖ the complaint that the agent rapidly disintegrates by oxidation. Hence  
 ❖ the smaller the package the less the loss. As a matter of fact the re-  
 ❖ verse is true, as it is almost impossible to preserve the contents of the



- ❖ small phials once they are opened, so that the final expense is greater than with Shreier's package. This is shaped like a short test tube, the sodium and potassium appearing like an amalgam, covered at the top by about a quarter of an inch of paraffin. In order to reach it, an instrument is used to puncture a hole in the paraffin, thus gaining access to the sodium and potassium compound, but immediately after the treatment of a tooth the hole in the paraffin should be closed by pressing into it a warm burnisher. This prevents the oxygen of the air from reaching it. and as it has a tremendous affinity for oxygen, if this precaution is not taken it will rapidly disintegrate by oxidation."

□   □   □

"SODIUM AND POTASSIUM is not primarily intended for use in canals

- ❖ in which living pulps are present. Nevertheless, in cases where pressure anesthesia has not been entirely satisfactory, or where the removal of the pulp has not been certainly accomplished, the compound may be used to good purpose. It is, of course, most undesirable to leave a terminal filament of the pulp at the apex, since by the following day when all effects of the anesthetic will have passed off, this filament will be found very much alive and exceedingly difficult to anesthetize. Where doubt exists therefore, it has been my practice after controlling the hemorrhage, and before the anesthetic effects have disappeared to use the sodium and potassium compound for extirpating the remains of the pulp, just as one would proceed in the presence of dead tissue.

□   □   □

"THE METHOD of using sodium and potassium is as follows: Select the

- ❖ finest of the Young Aseptic broaches, and having made a hole through the paraffin, push the broach down into the compound. It will come forth evenly charged with the amalgam-like mass, and must be used immediately, as the compound oxidizes rapidly when exposed to the air. Therefore the rubber dam should be in place, the cavity cleared of all debris and ready access to the opening of the canals must have been procured by freely cutting away the occlusal surface. Let us suppose that the opening to a canal has been found but that a fine clean broach has failed to penetrate more than a quarter of the length of the canal. We desire, with the aid of the compound, to clear out this canal to the apex. The fine broach freshly charged with the compound, is forced into the canal as far as it will go, using an up and down stroke. A rotary movement may also be exerted, but only with the greatest caution. Have the following axiom constantly in mind when working in root canals. *A broach will never break if moved only forward and back in a canal, but may and often does break when rotated.* The reason is simple. If the end jams it can best be dislodged by a straight backward withdrawal. It can often be broken by rotating it. Therefore avoid rotation of a broach as much as possible.

□   □   □

"THERE IS ONE other thing needed besides the sodium and potassium in

- ❖ reaching the end of a canal. This fine broach naturally carries but a very small dose of the compound to the part of the canal which is filled with partly calcified material. Therefore time is required. The story will be like this. Charge the broach with the compound and pump the



## Items of Interest

❖ instrument gently back and forward a few times. No progress! Cleanse the broach, and recharge it. No progress! Repeat the process. No progress! Repeat the process. No progress! Repeat the process. No progress! Here some impatient men abandon the treatment, and wander around dental meetings declaring: 'There is nothing in that sodium and potassium treatment. I have tried it.' Other men proceed as follows: Recharge the broach, pump back and forth. "Ah! That went a little deeper!" Repeat. "Ah! A little deeper still!" After which the progress is usually satisfactorily rapid. In many cases the calcification of the pulp has built a bridge across the canal which prevents ingress, and it takes some time to break down this mass chemically by the action of the sodium and potassium, but having passed this point the balance of the canal may be fairly easy. And it is exactly this class of unfilled root that gives trouble because the dentist by stopping at the bridge, as it were, leaves imprisoned in the canal beyond, a considerable mass of material which is most attractive pabulum for bacterial organisms.

□ □ □

"SOMETIMES, however, the entire canal is filled up with calcific material and there is no such satisfactory result as to find the broach suddenly passing the bridge and plunging forward into comparatively clear space. It is these cases of almost complete calcification that test a man's patience as well as his ability to convince his patient that the service will be worth the time and money expended upon it. Yet both may be done.

□ □ □

"BUT IT IS NOT alone in the presence of calcific material that sodium and potassium is valuable. It is a magnificent agent for sterilizing infected canals, and even may be relied upon to sterilize the tubuli. Its power as a germicidal agent was well proven in a series of tests carried on a few years ago, with the assistance of a competent bacteriologist. The operator was supplied with sterilized glass tubes, into which broaches to be tested were placed by first breaking off one end of a tube and then after introducing the broach resealing the tube by melting the end in an alcohol flame. Some of these broaches were bare broaches used for exploring infected canals. Others were broaches which had been charged with sodium and potassium and then used for sterilizing the canals. Some of these latter were even dipped directly into pus. In all cases cultures were procurable from the dry broaches used, but in no single instance could a culture be obtained from any of the broaches which had been charged with the sodium and potassium."

□ □ □

"HAVE YOU ever had any pain or trouble," asked an Atlanta man, "from having the compound pass through the end of the root? I have had considerable pain from having a tiny particle drop on the back of my hand, and I do not think I would care to have it go beyond the apex."

□ □ □

"ONE SHOULD certainly be cautious in young teeth, or any teeth having large foramina. Yet after twenty years' experience with the compound I do not recall a single case of irritation or trouble of any sort. It must be remembered that it is to be used only on the finest of broaches, and



- ❖ that it oxidizes so rapidly that it is frequently difficult to get a good
- ❖ dose of it far up into a canal. Usually, therefore, one need have no
- ❖ anxiety on that score."

❖   ❖   ❖

"DOES THIS COMPOUND sufficiently cleanse out a canal," asked a friend  
❖ from Columbus, "so that one may immediately fill it?"

❖   ❖   ❖

"THAT IS A TIMELY question. It does not cleanse the canal at all, Where  
❖ calcific material is present it breaks down their solidity so that the  
❖ particles may be picked out. And where only soft tissue is present by  
❖ chemical combination it forms a mass almost resembling green soap.  
❖ After treating a canal which may have appeared clean prior to treat-  
❖ ment, it will be a revelation to many to see the débris that may be re-  
❖ moved. This after treatment includes syringing with peroxide of hydro-  
❖ gen into which is mixed mercury bi-chloride (1 to 500), after which I  
❖ prefer to go further and cleanse the canal with whisps of cotton wound  
❖ on the finest of the Young broaches and dipped in the same peroxide  
❖ solution. When these bits of cotton are withdrawn they should be re-  
❖ moved from the broach onto a napkin, when they will appear as a  
❖ green stripe. A new whisp is introduced and the process continued so  
❖ long as these bits of cotton show any color, after which the syringe  
❖ should be again used, followed by clean sterile cones of bibulous paper  
❖ for removing the moisture."

❖   ❖   ❖

"I AM GOING to try it," said the Cleveland man. "Ditto likewise," remarked  
❖ the others present. "I wanted to ask someone to tell me the best  
❖ method of applying arsenic," said the Atlanta man. "There is no best  
❖ way," said the Minneapolis dentist, "all methods are bad." "Oh! I  
❖ don't know about that," said our friend from Cincinnati. "But it is too  
❖ late to tell you about it to-night. To-morrow night, perhaps."





### **National Society Meetings.**

AMERICAN INSTITUTE OF DENTAL TEACHERS, Ann Arbor, Mich, January  
28-30, 1915.

Secretary, Dr. J. F. Biddle, 517 Arch St., N. S., Pittsburgh, Pa.

PANAMA-PACIFIC DENTAL CONGRESS, San Francisco, Cal., 1915.

Secretary, Dr. Arthur M. Flood, 240 Stockton St., San Francisco,  
Cal.

### **State Society Meetings.**

OHIO STATE DENTAL SOCIETY, Columbus, O., December 1-3, 1914.

Secretary, Dr. F. R. Chapman, 305 Schultz Bldg., Columbus, O.